Hospital Library

The New England JOURNAL of MEDICINE

FORMERLY THE BOSTON MEDICAL AND SURGICAL JOURNAL

Official Organ of The Massachusetts Medical Society
The New Hampshire Medical Society — The Vermont State Medical Society
The New England Surgical Society — The Boston Surgical Society, Inc.
The New England Pediatric Society — The New Hampshire Surgical Club
The New England Obstetrical and Gynecological Society
And The Neisserian Medical Society of Massachusetts

OWNED AND PUBLISHED BY THE MASSACHUSETTS MEDICAL SOCIETY

Volume 208 Number 2 | Domestic $6 per Annum, 25c per Copy Canada $7.04, Foreign $8.52 | JANUARY 12, 1933 | Published Weekly in Boston at 8 The Fenway

CONTENTS

NEW ENGLAND SURGICAL SOCIETY

The Treatment of Cancer of the Prostate. *George Gilbert Smith* 57
Annual Report of the Committee on Fractures for the New England Surgical Society, 1932. 65

The Pharmacology of Digitalis in Relation to the Therapy of Heart Disease. *Henry A. Christian* 66
Relationships Between Emotional States and Organic Disease. *Maurice Fremont-Smith* 69
Considerations on Protein and Salt Therapy in the Various Types of Bright's Disease. *Allan M. Butler* 71

VERMONT STATE MEDICAL SOCIETY

Pneumothorax Treatment in Tuberculosis. *Edward J. Rogers* 78
Miscellany 79

Health Education in the City of Boston. (Continued.) *Ruth I. Parsons* and *C. E. Turner.* 81

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

Cases 19021, 19022, 19023 and 19024—Types of Ulcerative Colitis. *Henry D. Stebbins, Chester M. Jones, Daniel F. Jones, Tracy B. Mallory, David W. Wallwork, Walter E. Garrey, George W. Holmes* and *Paul D. White* 89

EDITORIALS

An American Tragedy 97
The Board of Registration in Massachusetts and in Other New England States 97
A New Era in Psychiatry 98
This Week's Issue 99

(*Contents continued on next page*)

Glandular Therapy in the Gynecology of General Practice

NEW BOOK

That's what this book is—a clinical work telling the *general practitioner as well as the gynecologist* just when and why and *how* to use glandular therapy. It is a book on *diagnosis and treatment* in detail—methods that have been tested and proved in actual practice. It follows the sequential order of the functional phases of the woman—puberty, menstruation, pregnancy, lactation, and the menopause. It includes a presentation of a simple office method of obtaining the anterior pituitary hormone in whole urine—ready for office administration. It gives the detailed technic of the Aschheim-Zondek test for pregnancy, the Friedman test, the oestrin test, Siddall test, hormonal skin test, the Aschheim-Zondek test for the diagnosis of hydatidiform mole and for chorionepithelioma—and *interprets* every one of these tests in *terms of the bedside.* There are 135 pages on the diagnosis and treatment of menstrual disorders, and an entirely new and enlightening discussion of *functional sterility.*

This is a complete, modern, practical exposition of the entire subject of clinical endocrinology of the female.

Octavo of 518 pages, illustrated. By CHARLES MAZER, M.D., Assistant Professor of Gynecology and Obstetrics, Graduate School of the University of Pennsylvania, and LEOPOLD GOLDSTEIN, M.D., Demonstrator of Obstetrics, Jefferson Medical College. Cloth, $6.00 net.

W. B. SAUNDERS COMPANY — Philadelphia and London

Entered at the Postoffice at Boston as Second Class Matter

CONTENTS

(Continued)

MASSACHUSETTS LEGISLATIVE NOTES..... 99

BOOK REVIEWS

The Curative Value of Light. Edgar Mayer..... 111
Hydrotherapy in Hospitals for Mental Diseases. Rebekah Wright..... 112
Internal Medicine. Its Theory and Practice in Contributions by American Authors..... 110

BOOKS RECEIVED FOR REVIEW..... 112

CORRESPONDENCE

Articles Accepted by the American Medical Association Council on Pharmacy and Chemistry..... 102
Lack of Agreement with the Letter of Dr. Haigh. Charles Malone..... 102

MISCELLANY

Medical Personnel and Facilities Inadequate to Meet Real Needs of U. S. People, Experts Find..... 100
The Tuberculosis Record for 1931. Frederick L. Hoffman..... 77

NOTICES..... 103

RECENT DEATHS..... 102

REPORTS AND NOTICES OF MEETINGS..... 104

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES..... 109

The Massachusetts Medical Society

The next Annual Meeting of the Massachusetts Medical Society will be held at the Hotel Statler, Boston, on Monday, Tuesday and Wednesday, June 5, 6, 7, 1933.

OFFICERS AND STANDING COMMITTEES ELECTED BY THE COUNCIL, JUNE 8, 1932

PRESIDENT: HALBERT G. STETSON, 39 Federal Street, Greenfield.
VICE-PRESIDENT: WALTER A. LANE, 173 School Street, Milton.
SECRETARY: WALTER L. BURRAGE, 182 Walnut Street, Brookline.
TREASURER: CHARLES S. BUTLER, 257 Newbury Street, Boston.

STANDING COMMITTEES FOR 1932-1933

COMMITTEE OF ARRANGEMENTS
F. H. Colby, *Chairman;* G. P. Reynolds, W. M. Shedden, William R. Morrison, Horatio Rogers.

COMMITTEE ON PUBLICATIONS
Homer Gage, *Chairman;* J. W. Bartol, R. I. Lee, R. B. Osgood, R. M. Smith.

COMMITTEE ON MEMBERSHIP AND FINANCE
D. N. Blakely, *Chairman;* Gilman Osgood, G. C. Caner, J. E. Fish, H. F. Newton.

COMMITTEE ON ETHICS AND DISCIPLINE
David Cheever, *Chairman;* W. D. Ruston, S. F. McKeen, A. C. Smith, R. L. DeNormandie.

COMMITTEE ON MEDICAL EDUCATION AND MEDICAL DIPLOMAS
Reginald Fitz, *Chairman;* C. H. Lawrence, C. A. Sparrow, E. S. Calderwood, A. S. Begg.

COMMITTEE ON STATE AND NATIONAL LEGISLATION
H. G. Stetson, *Chairman;* T. J. O'Brien, F. E. Jones, A. W. Marsh, Shields Warren.

COMMITTEE ON PUBLIC HEALTH
Dwight O'Hara, *Chairman;* E. F. Cody, F. G. Curtis, Gerald Hoeffel, G. D. Henderson.

COMMITTEE ON MALPRACTICE DEFENSE
F. G. Balch, *Chairman;* E. D. Gardner, F. B. Sweet, R. P. Watkins, A. W. Allen.

COMMITTEE ON PERMANENT HOME: T. J. O'Brien, *Chairman;* S. B. Woodward, C. G. Mixter, J. M. Birnie, R. B. Greenough.

OFFICERS OF THE SECTIONS FOR 1933

ELECTED BY THE SECTIONS

The street addresses may be obtained from the Annual Directory

SECTION OF MEDICINE
Chairman, J. H. Means, Boston; *Secretary,* H. L. Blumgart, Boston.

SECTION OF SURGERY
Chairman, A. G. Rice, Springfield; *Secretary,* E. M. Daland, Boston.

SECTION OF TUBERCULOSIS
Chairman, Roy Morgan, Westfield; *Secretary,* Donald S. King, Boston.

SECTION OF PEDIATRICS
Chairman, E. S. O'Keefe, Lynn; *Secretary,* Joseph Garland, Boston.

SECTION OF OBSTETRICS AND GYNECOLOGY
Chairman, F. A. Pemberton, Boston; *Secretary,* J. W. O'Connor, Worcester.

SECTION OF RADIOLOGY AND PHYSIOTHERAPY
Chairman, Edward H. Trowbridge, Worcester; *Secretary,* Charles W. Blackett, Jr., Newtonville.

OFFICERS OF THE DISTRICT MEDICAL SOCIETIES

ELECTED BY THE DISTRICT MEDICAL SOCIETIES AT THEIR ANNUAL MEETINGS, BETWEEN APRIL 15 AND MAY 15, 1932.

The street addresses may be obtained from the Annual Directory

BARNSTABLE—*President,* G. H. Gray, Hyannis; *Vice-President,* J. L. Chute, Osterville; *Secretary,* J. I. B. Vail, Hyannis; *Treasurer,* H. B. Hart, Yarmouth Port; *Librarian,* E. E. Hawes, Hyannis.

BERKSHIRE—*President,* A. C. England, Pittsfield; *Vice-President,* M. H. Walker, Jr., Pittsfield; *Secretary,* H. J. Downey, Pittsfield; *Treasurer,* C. T. Leslie, Pittsfield.

BRISTOL NORTH—*President,* B. M. Latham, Mansfield; *Vice-President,* F. V. Murphy, Attleborough; *Secretary,* C. B. Kingsbury, Taunton; *Treasurer,* J. V. Chatigny, Taunton.

BRISTOL SOUTH—*President,* J. M. Salles, New Bedford; *Vice-President,* J. H. Lindsey, Fall River; *Secretary,* Charles Shanks, New Bedford; *Treasurer,* Charles Shanks, New Bedford.

ESSEX NORTH—*President,* O. P. Mudge, Amesbury; *Vice-President,* P. H. Coffin, Haverhill; *Secretary,* E. S. Bagnall, Groveland; *Treasurer,* E. S. Bagnall, Groveland; *Librarian,* A. M. Hubbell, Haverhill.

ESSEX SOUTH—*President,* C. L. Curtis, Salem; *Vice-President,* C. L. Hoitt, Lynn; *Secretary,* R. E. Stone, Beverly; *Treasurer,* Andrew Nichols III, Danvers; *Librarian,* C. M. Cobb, Lynn.

FRANKLIN—*President,* A. E. Johnson, Jr., Greenfield; *Vice-President,* H. B. Marble, Shelburne Falls; *Secretary,* Charles Moline, Sunderland; *Treasurer,* Charles Moline, Sunderland.

HAMPDEN—*President,* F. H. Allen, Holyoke; *Vice-President,* J. Z. Naurison, Springfield; *Secretary,* H. L. Smith, Springfield; *Treasurer,* H. L. Smith, Springfield.

HAMPSHIRE—*President,* M. E. Cooney, Northampton; *Vice-President,* J. D. Collins, Northampton; *Secretary,* F. E. O'Brien, Haydenville; *Treasurer,* F. E. O'Brien, Haydenville; *Librarian,* Jane B. Armstrong, Northampton.

MIDDLESEX EAST—*President,* E. M. Halligan, Reading; *Vice-President,* E. E. Tyzzer, Wakefield; *Secretary,* A. R. Cunningham, Winchester; *Treasurer,* Richard Dutton, Wakefield; *Librarian,* J. M. Wilcox, Woburn.

MIDDLESEX NORTH—*President,* Pierre Brunelle, Lowell; *Vice-President,* B. H. Pillsbury, Lowell; *Secretary,* T. A. Stamas, Lowell; *Treasurer,* M. D. Bryant, Lowell; *Librarian,* P. J. Meehan, Lowell.

MIDDLESEX SOUTH—*President,* F. W. Gay, Malden; *Vice-President,* A. H. Blake, West Somerville; *Secretary,* A. A. Levi, Cambridge; *Treasurer,* Edward Mellus, Newton.

NORFOLK—*President,* S. F. Curran, Dorchester; *Vice-President,* A. S. Begg, West Roxbury; *Secretary,* F. S. Cruickshank, Brookline; *Treasurer,* G. W. Kaan, Sharon.

NORFOLK SOUTH—*President,* W. J. McCausland, Quincy; *Vice-President,* F. A. Bartlett, Quincy; *Secretary, Treasurer and Librarian,* N. R. Pillsbury, South Braintree.

PLYMOUTH—*President,* C. G. Miles, Brockton; *Vice-President,* D. B. Tuholski, Brockton; *Secretary,* G. A. Moore, Brockton; *Treasurer,* A. C. Smith, Brockton; *Librarian,* J. H. Weller, Bridgewater.

SUFFOLK—*President,* W. H. Robey, Boston; *Vice-President,* J. H. Means, Boston; *Secretary,* L. S. McKittrick, Boston; *Treasurer,* John Rock, Boston.

WORCESTER—*President,* E. R. Leib, Worcester; *Vice-President,* W. C. Seelye, Worcester; *Secretary,* E. C. Miller, Worcester; *Treasurer,* E. T. Disbrow, Worcester; *Librarian,* A. C. Getchell, Worcester.

WORCESTER NORTH—*President,* R. A. Rice, Fitchburg; *Vice-President,* C. E. Thompson, Gardner; *Secretary,* F. M. McMurray, Fitchburg; *Treasurer,* F. H. Thompson, Jr., Fitchburg.

Fellow Members! We want your support.

The New England
Journal of Medicine

VOLUME 208 JANUARY 12, 1933 NUMBER 2

NEW ENGLAND SURGICAL SOCIETY

THE TREATMENT OF CANCER OF THE PROSTATE*

BY GEORGE GILBERT SMITH, M.D.†

THE treatment of prostatic cancer is not a simple problem; the objective varies widely in different cases. In early cancer, before the growth has extended beyond the capsule of the gland, the possibility of cure is before us, but relatively few cases are discovered while they are still in this stage. When the growth has developed beyond this point, the question of cure is no longer pertinent; the object of treatment then is to relieve urinary obstruction, if that exists, and to retard as much as possible further extension of the growth. If bony metastases have already taken place, as is the case in from 30 to 50 per cent of all patients when first seen (Bumpus[6]) (Barney and Gilbert[2]), one's efforts must be directed toward relieving the pain caused by those metastases, as well as toward removing whatever obstruction to urination there may be.

A knowledge of the probable course of the disease is essential as a foundation for planning the attack upon it. It is generally accepted, although disputed by some, that in eighty per cent of all cases of prostatic cancer, the growth begins in the posterior lobe. So long as the carcinoma is confined to this lobe, it is not likely to give symptoms, but when it infiltrates the median bar, obstruction to urination is a probable result. In many instances, a coincident hypertrophy of the lateral lobes is the real cause of obstruction; if these lobes are removed, the patient may get along without urinary trouble for a number of years. Carcinoma of the prostate, as has been demonstrated by a good many cases, is often slow in developing, particularly in the early stages. Bumpus[6] reports two cases that lived ten years without any treatment. Even after the disease has become widely metastatic, the patient may live for several years. The growth extends from the prostate into the vesicles and along the lymphatics which pass from the prostate through the intervesicular space to the iliac glands, metastases occur most commonly in these, also in the retroperitoneal glands and the bones of the pelvis and the lumbar spine. Not infrequently we encounter cases in which the primary focus is entirely silent, the symptoms being due to skeletal metastases.

In this paper there is not time to consider the diagnosis or the symptomatology of this disease, except to say that the diagnosis is dependent chiefly upon the feeling of resistance and hardness when one palpates the prostate by rectum; the outstanding symptoms which we are most often asked to relieve are obstruction to urination and pain in the lumbar spine and thighs.

In this paper I shall discuss the various therapeutic measures which have been employed in cancer of the prostate as regards their applicability to the different stages of the disease, and their effectiveness.

X-RAY TREATMENT

Since the treatment of deep-seated cancer with high voltage x-ray was first advocated, thousands of cases have been treated by radiologists, but except in the case of certain very radiosensitive tumors, such as embryonal carcinomas of the testicle, the results have been disappointing to those who expected to bring about complete destruction of the growth. Failure to accomplish this does not mean that the method is entirely without value; experience has shown that deep x-ray therapy will usually relieve pain and will frequently reduce the size of metastases in lymph nodes. There is some evidence that even the primary focus of the growth may be materially benefited. Greenough[7] attributes the favorable effects of x-ray to two factors: (a) actual destruction of tumor cells; (b) formation of fibrous tissue about the tumor cells, thereby limiting their spread.

In a paper on "The Value of High Voltage X-ray Therapy in Carcinoma of the Prostate," Smith and Peirson[10] report a case of cancer of the prostate that received four series of x-ray treatments over a period of fifteen months. Under this treatment, the prostate, which at first had seemed too extensively diseased for radical removal, became smaller and was removed in toto by a perineal prostatectomy. Microscopic study of the gland showed a definite response to radiation. Dr. Shields Warren, pathologist at

*Read at the Annual Meeting of the New England Surgical Society at Hartford, Conn., October 1, 1932.

†Smith—Urologist, Massachusetts General Hospital and Palmer Memorial Hospital. For record and address of author see "This Week's Issue," page 99.

the New England Deaconess Hospital, made the following comments upon the sections:

> "While there are tumor cells present in various portions of the slide, the fibrosis is extremely marked, far more than I have ever seen carried as stroma by any prostatic tumor. In some portions of the slide the epithelial cells are abundant with relatively little stroma and here the growth of the tumor is presumably fairly active if the immaturity of the cells and the frequency of mitosis are any criterion. This portion where the tumor appears more rapidly growing contains a moderate number of blood vessels in the stroma in contrast to the relatively avascular condition of the more fibroblastic portions. I feel one is justified in interpreting the appearance in these slides as the result of the radiation to which the tissue had been subjected. The fact that tumor cells are still present even in the most fibrosed areas is an indication that this degree of radiation is not sufficient to kill the cells of the tumor and may have acted by stimulating the growth of the stroma."

That this result cannot always be duplicated is no doubt true, but this case proves that, at least in some instances, deep x-ray therapy can affect the primary growth. We have seen a number of cases in which large secondary growths in the iliac glands have been so reduced in size that the accompanying edema of the leg has been very materially diminished.

In the paper mentioned above, Smith and Peirson reported the results of high voltage x-ray therapy in twenty-five cases of cancer of the prostate. Eighteen of these cases suffered from pain in the back, legs or pelvis; all of these were relieved of pain following radiation. This relief varied in degree from partial to complete and in duration from one to six months. One series of treatments frequently relieved pain for three months. The prompt relief of pain was sometimes remarkable.

The effect of radiation upon the prostate itself was less pronounced. In nine cases the gland appeared to be smaller after treatment, in ten it continued to increase in size, in two it showed no change. It was our impression that in a number of the cases so treated, the progress of the growth appeared to be checked for from one to two years. The degree of urinary obstruction was not affected.

Because of the effect of high voltage radiation upon the skin, the number and intensity of exposures must be limited. Four or at most five series of treatments, given at intervals of two or three months, are as many as most radiologists feel that it is safe to give.

The Use of Radium

The introduction of radium as a means of destroying cancer, produced a wave of optimism which has not yet ebbed away. Most of the surgeons who have written much on urological subjects have recorded their experiences with the use of this interesting element, but a review of this literature leaves one with most confused impressions as to the value of radium. Hugh Young[13], who treats his cases by thirty daily applications of one hundred milligram hours through rectal, urethral and vesical aspects, as well as by the insertion of needles through the perineum, has found that "by this means the local growth is inhibited, urinary obstruction usually prevented, and the remainder of the patient's life made comfortable. In some cases the duration of life appears to be decidedly lengthened and it may be that in a few cases cures have been obtained."

Bumpus[5] in 1922 reported the results of radium treatment in one hundred and fifty-two cases. Of these, eighty-three per cent were dead within two years. Although the average duration of life after radium treatment was not so long as that following partial prostatectomy, it was longer than in untreated cases.

Barringer[4], who has been the most enthusiastic advocate of radium treatment, said in 1928 that from five to ten per cent of cases of prostatic cancer can be controlled by radium sufficiently well to make us think that the patient is cured. Of two hundred and two cases reported by him, thirty were alive three or more years after treatment.

Among the French urologists, Legeau has discarded the use of radium in this disease; Marion[9] says that radiotherapy gives few encouraging results, although he has seen some marked temporary improvements; Chevassu employs radium "with the hope of seeing good results", and Papin uses it in cases unsuited for perineal prostatectomy[1].

It is not illogical to believe that cancer in the prostate, as well as in other accessible localities, should respond to radiation. Either through the open bladder or through the perineum, seeds or needles can be placed within the substance of the gland and any desired amount of radiation can be given. It has been repeatedly demonstrated that the effect of radioactive substances upon tumor cells is destructive. Cells in process of mitotic division are especially sensitive to radiation; the cancer cells which are killed are supplanted by growing connective tissue which eventually forms a dense fibrous stroma, imprisoning in its meshes those tumor cells which are not destroyed. Experimental studies with tumor tissue show that as a result of heat or radiation not strong enough to kill the tumor cells, the cells may nevertheless lose the capacity for rapid growth and may become enclosed in a fibrous capsule[8].

These observations, while theoretically correct, emanate from the laboratory. A more correct estimate of the value of radium, at least from the clinical point of view, is given by Greenough[7], who in 1920 stated that radiation insufficient to cause a massive destruction results in inhibition of cell division lasting for longer or shorter periods, followed by a stimulated or

abnormal growth. "If we are to cure cancer by radiation," he said, "cell destruction must be 100%. *This is feasible only when adequate drainage for necrotic tissue is provided.*" (Italics ours.)

With this opinion of Greenough's our experiences with radium force us to agree. A short time ago the writer reviewed the results of radium treatment in twenty-nine patients with carcinoma of the prostate. Several cases were treated twice, at considerable intervals of time; there were thirty-two treatments in all. Reduction of the facts to the briefest possible number shows that three cases were treated by the insertion of seeds or needles through the perineum; eleven cases had partial perineal prostatectomies, with the implantation of radium in the remaining shell of prostatic tissue; in sixteen cases radium was implanted through the open bladder. In most of these cases the obstructing median bar was removed at the same time. In two others, radium was implanted in the tips of the vesicles after total perineal prostatectomy. Radium was employed as radon (radium emanation) in gold seeds and in steel needles, and as the element in platinum needles. The dosage varied from 450 millicurie hours to 5544 millicurie hours. (For details see Table I.)

TABLE I

RESULTS OF RADIUM TREATMENT

Methods of application	No. cases	Dosage	Result
Through perineum without open operation	3	1000 mc. hrs. 665 mc. hrs. 450 mc. hrs.	Reobstructed—10 months. Reobstructed—12 months. Reobstructed—11 months.
Implanted in tips of vesicles after total prostatectomy	2	756 mc. hrs.	Died 3 months later—Perineum never healed. Died 14 months later—Carcinomatosis. Developed recto-urethral fistula.
Implanted in prostate after partial prostatectomy	11	Average dose 2248 mc. hrs.	Operative deaths—3. Died of cancer—6, average 14 months. Living—1. 9 months. Untraced—1.
Implanted in prostate through cystotomy	16	Average dose 3353 mc. hrs.	Operative deaths—3. Died of cancer—7, average 8 months after op. Died, cause unknown—1, 4 years after op. Living—5. 2 under 1 yr. 2 under 2 yrs. 1—4 yrs. 10 mos.

In twenty-nine operations, there were six operative deaths (21%). Three were due to embolus, two to cardiac failure, one to sepsis. Sixteen died of cancer, the average length of life after operation being thirteen months. One patient, operated on in 1922, cannot be traced, nor can any record of his death be found. Of the six known to be alive, one has lived four years and nine months since operation. He is incontinent, has sclerosis of his bladder neck and a bladder which holds only one ounce. He is losing weight and although x-rays show no bony metastasis, he looks cachectic. Another, one year and ten months after operation, has developed a recto-urethral fistula and his cancer is growing rapidly. A third, one year and seven months after operation, has had his suprapubic sinus reopen and passes bloody urine, but his general condition is good. Three others were operated on eight or nine months ago; all have control and void spontaneously, but all have suffered severely from strangury and pain at the neck of the bladder.

The suffering which these patients have endured might be borne more philosophically if one could promise them a cure. Unfortunately, we have evidence that prostatic implantations of radium, even if large doses are used, do not always destroy the cancer. Four cases, treated respectively with 4054, 4100, 3840 and 2680 millicurie hours, have shown viable cancer cells in prostatic tissue removed either by punch or at autopsy.

Attempts have been made, by varying the type of applicators, the screening and the dosage, to prevent the postradiation cystitis which has lasted for so many months and has caused such suffering; but the facts seem to be that unless the dose is so small that it cannot be expected to destroy the cancer, these unhappy sequelae cannot be avoided. There is a possibility that small doses—not over 1000 millicurie hours—while not powerful enough to destroy the growth, may behave as does deep x-ray therapy, and by setting up a fibrosis hinder the extension of the cancer cells and so temporarily check the progress of the disease. Larger doses, aimed at complete destruction of the growth as is done in carcinoma of the cervix, cannot be em-

ployed with success because of the proximity of the bladder, with its sensitive mucous membrane, and because a poorly drained, necrotic mass is formed in which infection flourishes without hindrance.

SURGERY

We have considered the treatment of the malignant prostate by x-ray and by radium; what about the surgical approach? Under this heading may be included the various intraurethral methods of removing the obstruction to urination, such as the punch operation and the newer methods of resection by means of the electrical current, partial perineal prostatectomy, suprapubic prostatectomy, permanent suprapubic drainage and total perineal prostatectomy. With the exception of the last, all of these methods are aimed solely at relief of obstruction; if an attack upon the cancer itself is thought advisable, x-ray or radium has been used in addition.

I will state my thesis plainly at the outset; if the growth is confined within the prostatic capsule, or at most has only just begun to invade the vesicles, total perineal prostatectomy should be done, for it will not only remove the obstruction but will offer a chance of cure. If the growth has progressed to a point where this operation is not advisable, any method that will remove obstruction may be considered. The intraurethral methods are very useful in this latter situation; usually the patient's tenure of life is limited to one or two years, and often the operation can be repeated if obstruction recurs. Suprapubic prostatectomy is most unsatisfactory unless the obstruction happens to be due to a coincident hypertrophy of the lateral lobes; in that event, relief to obstruction is obtained and may last for several years. It is a great mistake, however, to attempt to enucleate a malignant prostate; if one finds that he has, through an error in diagnosis, got into such a predicament, he should be content with excision of the median bar or with instituting suprapubic drainage. Partial perineal prostatectomy has been advocated by Chute, who has frequently done it repeatedly upon the same patient and so carried him along in comfort for a number of years. It seems probable that with the development of prostatic resection, partial perineal prostatectomy will become less frequently indicated.

The same argument may apply to suprapubic cystostomy. Of this operation Bumpus[6] in 1926 said: "No other form of treatment has proved as free from risk, caused so little suffering or so lengthened life." It is obvious that whenever obstruction can be relieved by prostatic resection or a punch operation, such a procedure is vastly more agreeable to the patient than is a permanent cystostomy. In bedridden, terminal cases, or in those whose prostatic growth is too extensive to permit the intraurethral operations, or in those with severe cystitis, suprapubic drainage is the best solution. It can be done under local anesthesia with comparatively little risk.

Of all the surgical methods of attacking cancer of the prostate, total perineal prostatectomy is the only really aggressive one. First described by Hugh Young[12] in 1905, its possibilities, for reasons I do not know, have been neglected by the great majority of surgeons. It is not a difficult operation to do, but it does require a knowledge of the anatomy of the perineum and an ability to diagnose prostatic cancer in the relatively early stages.

TABLE II

RESULTS OF TOTAL PROSTATECTOMY

Operative deaths	3
Died of Cancer	18
Living but with recurrence or metastasis	4
Living and apparently well	17
	42

My experience with this operation has been confined to forty-two cases; these have been operated upon in the last thirteen years. In all, the diagnosis has been established by microscopic examination. There were three operative deaths; a man of eighty-four died of shock the day after operation, another octogenarian died three weeks after operation of heart block and a third patient died four days after operation of cardiac failure. A fourth case died in the hospital three months after operation, probably from carcinomatosis; he had a persistent perineal fistula caused by the implantation of radium into a seminal vesicle. Seventeen other cases died of cancer with an average duration of life of twenty-seven months. Only one of these cases developed urinary obstruction before death. Four cases are alive but show local recurrence or metastases in the spine. None of these has any urinary obstruction. Seventeen cases are alive and apparently well. Most of these have been examined by the writer recently, and rectal examination done. A few reported by letter. The time elapsed since operation is shown in Table III. As for the mat-

TABLE III

TIME ELAPSED AFTER TOTAL PROSTATECTOMY

	Under 1 yr.	Years 1-2	Years 2-3	Years 3-4	Years 4-5	Years 6-7	Years 7-8	Total
Deaths from cancer	5	6	3	2	0	1	1	18
Living but with recurrence	0	1	0	0	1	1	1	4
Living and apparently well	6	4	1	3	2	1	0	17
								39

ter of urinary control, the lack of which is sometimes alleged to result from this operation, twenty-eight cases had good control, three poor, four none. In three cases the degree of control was not noted. Hugh Young's[11] series of thirty-eight total perineal prostatectomies shows a higher percentage of good results. Of his thirty-eight cases

4 died in hospital.
2 have been discharged less than one year.
24 were free from recurrence or metastasis.
5 showed recurrence.
3 developed metastases.

38

Of the thirteen who are alive and free from recurrence or metastasis, six have gone five or more years since operation; of the eleven who have died without recurrence or metastases, five lived five or more years. Young reports three autopsies on cases dying one year, three years and six and one-half years after operation, with no cancer discoverable. Among his cases that are living and well, one was operated upon seventeen years ago, one thirteen years ago, two seven years ago and one six years ago. Two died without recurrence nine years after operation, two seven years after, and one six years after.

These figures belie such pessimism as Barney[3] shows when he says "Some do what is known as a radical or total perineal prostatectomy in the vain hope that once in a while an early case will be cured. . . . It is obvious, therefore, that since he cannot prolong life or effect a cure, the surgeon should subject his patient to the simplest form of treatment, operative or otherwise, which will keep him comfortable."

Teaching such as this I believe should be contradicted, for it is only by striving to detect these cases earlier with the object of performing a radical removal of the cancer that we can make progress against this disease.

In conclusion, I would state once more my conviction that in early cases of prostatic cancer, total prostatectomy should be done. If the diagnosis is uncertain, the prostate should be exposed perineally and a piece removed for immediate diagnosis. Whether total or only partial prostatectomy should be done will be determined by the pathologist's report.

In cases too advanced for this, obstruction should be relieved by one of the intraurethral operations, if such is possible; if not, partial perineal prostatectomy or permanent suprapubic cystotomy should be done. For relief of pain from metastases, deep x-ray therapy should be employed; to retard the development of the primary growth, radiation by high voltage x-ray or by small doses of radium should be carried out. From five to ten per cent of prostatic cancers are radiosensitive and may be favorably affected by these measures. The employment of radium with the idea of destroying the cancer has in my hands proved a great disappointment.

REFERENCES

1 Astraldi, A.: Recuerdos Cientificos de Viaje. Rev. de especialid. 5:742, 1930 (Abst. in Am. J. Cancer. 15[1]:489 (Jan.) 1931.
2 Barney, J. D., and Gilbert, A. C.: Some clinical observations on cancer of the prostate. Boston M. & S. J. 190:19 (Jan. 3) 1924.
3 Barney, J. D.: The problem of diagnosis and treatment of prostatic conditions. New Eng. J. Med. 207:313 (Aug. 18) 1932.
4 Barringer, B. S.: Carcinoma of the prostate and bladder. New Eng. J. Med. 198:117 (March 8) 1928.
5 Bumpus, H. C., Jr.: Cancer of the prostate: a comparison of results obtained by radium and surgical treatment. Surg. Gynec. Obst. 35:177, 1922.
6 Bumpus, H. C., Jr.: Carcinoma of the prostate: a clinical study of one thousand cases of carcinoma of the prostate. Surg. Gynec. Obst. 43:150, 1926.
7 Greenough, R. B.: The treatment of tumors by x-rays and radium. V. Congrès de la Soc. Inter. de Chirurg., Paris, July 19-23, 1920, p. 393.
8 Loeb, L.: The effects of roentgen rays and radioactive substances on living cells and tissues. J. Cancer Research. 7:229 (Oct.) 1922.
9 Marion, G.: A propos du traitement du cancer de la prostate. J. d'urol. 21:385, 1926.
10 Smith, G. G., and Peirson, E. L.: The value of high voltage x-ray therapy in carcinoma of the prostate. J. Urol. 23:331 (March) 1930.
11 Young, H. H.: Personal communication.
12 Young, H. H.: The early diagnosis and radical cure of carcinoma of the prostate. Bull. Johns Hopkins Hosp. 16:315, 1905.
13 Young, H. H., and Davis, David M.: Young's Practice of Urology, Philadelphia, W. B. Saunders Co. 1:671, 1926.

Discussion

Dr. W. O. Wilder, Springfield, Mass.: Cancer of the prostate is not unlike malignant conditions in other portions of the human body, challenging as it does, the knowledge and skill of every surgeon, in order to effect any degree of success in its treatment. Its insidious onset and oftentimes symptomless progress only add to its treacherous nature and make our effort to attain a happy result, most disappointing and disheartening in the large majority of cases.

Dr. Smith has favored us with a most honest and fair discussion of the treatment of carcinoma of the prostate. His extensive experience, both with radium and x-ray as well as surgical means, surely qualifies him to speak with decided authority on this subject. While he has not been dogmatic to any degree, he still has laid before us logical conclusions and suggestions as to the proper treatment of this condition.

For myself, I must admit I am a real pessimist whenever I encounter a case of cancer of the prostate. I hardly recall in the course of thirteen years in the practice of urology, one single case which I deemed suitable for radical removal, and as Dr. Smith has stated, early cases of prostatic cancer suitable for radical removal do not average more than five to ten per cent of cases seen. From this fact alone, it would seem to me that the medical fraternity, as a whole, is sadly negligent when it allows over ninety per cent of prostatic carcinomata to pass unnoticed until satisfactory relief is an impossibility.

In spite of the fact that Young and Randall have shown conclusively that carcinoma of the prostate does not always originate in the posterior lamella, we do know that practically eighty per cent form there and, were this information to be universally prominent in every medical man's mind, when examining a man over fifty years of age, I am strongly inclined to believe that instead of a measly five per cent of these cases of cancer of the prostate being found suitable for possible cure, either by radical removal or radium, a much larger proportion of pa-

tients with such a malignancy would be given a further lease of life.

Early diagnosis is surely of equal importance in cancer of the prostate as with that found in other parts of the body and when the simplicity of a rectal examination is considered, the appalling negligence in the early observance of this condition is a sad reflection on the thoroughness of many of our present day practitioners.

Given one of the five per cent early cases, where malignant process is limited to tissues within the prostatic capsule, I fully agree with Dr. Smith that the desirable mode of procedure is radical removal, as first suggested by Dr. Young in 1905. In the hands of men trained in perineal surgery, such a removal of the prostate is quite feasible and logical, especially so when one considers the density of the capsule surrounding the prostate.

In those cases where the carcinomatous process is so extensive as to rule out radical operation, I believe that radium has a certain usefulness sometimes in not only inhibiting the growth of the tumor but often causing sufficient shrinking to allow more perfect drainage.

In my opinion deep x-ray therapy should be reserved entirely for relief of pain caused by metastasis. Its usefulness is apparently limited to this narrow confine. In considering a treatment suitable for the cases of prostatic cancer with the extensive metastasis or growth involving the vesicles in which urinary obstruction is present, I have recently become enthused with the marked possibilities afforded by the new prostatic resector designed by McCarthy of New York. Instead of being compelled to subject a patient with obstructive carcinoma to a perineal operation or to a suprapubic cystotomy with its accompanying drainage for life, with the electrotome, it is possible under perfect vision to remove sufficient tissue from about the vesical orifice so as to allow almost if not complete emptying of the bladder at each voiding.

Such procedure is accompanied by practically no shock and confines the patient to the hospital for a comparatively short period. In my opinion such a resection of a carcinomatous prostate affords the nearest approach to an ideal result in this particular type of prostatic cancer that is at present available.

In conclusion I would again make an urgent plea for a more universal, rectal examination of men over fifty years of age.

Since we have had educational campaigns for the early detection of carcinoma in the breast of women why should it not be logical that we have a similar campaign for the early diagnosis of cancer in the prostate of men and thereby afford operators, skilled in perineal surgery, a more favorable chance for accomplishing real cures in this type of disease?

Dr. Alfred Mitchell, Jr., Portland, Maine: A famous surgeon, Dr. Charles H. Mayo, made the remark that whatever one does for a patient with carcinoma of the prostate gland is certain to be wrong. It surely presents a difficult problem to make a decision as to what treatment will make a patient comfortable for as long a period as possible, for, as ordinarily observed, patients consult the surgeon when the disease is too far advanced for any real hope of a radical cure.

Dr. Smith reports exceptionally fine results and is to be congratulated upon his success in the performance of the total extirpation of the diseased prostate, and says with modesty, that it is not a difficult operation to do, with which statement I think some of us will be inclined to disagree.

The removal of the diseased prostate, together with the seminal vesicles and bladder neck as advocated by Young, would appear to be a difficult procedure to the large number of men who are accustomed to perform their prostatic surgery by the suprapubic route. In the hands of men like Dr. Smith, Dr. Young and others thoroughly experienced in the perineal approach to the prostate, the operation would seem to be the method of choice in selected cases, but if attempted by the inexperienced, before they attain the necessary skill to perform this procedure successfully, I fear that there would be unfortunate results and incontinent persons who are not usually grateful patients.

The only cases I have known to be cured of cancer of the prostate have been those in which the gland was supposed to be benign at the time of operation and carcinomatous areas have been later found by the pathologist. When the disease is not too far advanced, the removal of the prostate as thoroughly as possible suprapubically, often gives a patient relief for a considerable period. While I am not able to give definite figures, I have a number of patients, living in comparative comfort, on whom this procedure was followed two or more years ago. I have also seen poor results, when this procedure was followed, in which it would have been much better to have left the prostate undisturbed.

My experience with radium implantation has been limited to comparatively few cases, and I am not able to form an opinion as to its value in carcinoma of the prostate from personal observation. There appear to be favorable results and others quite discouraging. My feeling is that the results are not sufficiently satisfactory to justify us to urge patients to undergo this treatment with the expense and at times marked discomfort following its use, but with the full understanding on their part of the possibilities, its use should be encouraged in selected cases.

Transurethral prostatectomy would seem to offer a palliative measure for relief of urinary obstruction and may do away for the most part with partial prostatectomy.

When the disease is far advanced and invades

the trigone and metastasis has taken place, I believe that the prostate should not be disturbed, and that patients would be more comfortable and live longer with permanent suprapubic drainage. A quite satisfactory drainage apparatus has been devised enabling patients to move about freely.

For the relief of pain due to bone metastasis massive x-ray therapy is of much service.

Dr. Arthur L. Chute, Boston, Mass.: This subject has interested me greatly for the past 20 years during which time I have been trying to decide what was the best treatment for carcinoma of the prostate, and I think Dr. Smith is to be greatly congratulated on his very temperate paper. There are, however, some points about which I do not entirely agree with him.

A short time ago I looked up 211 operations that I had done upon patients with carcinoma of the prostate. In a general way three-fourths of these cases were treated by subcapsular or partial perineal prostatectomy, while about one-fourth were done suprapubically; a complete perineal prostatectomy was done in but one instance and that patient died in two years; radium was used in a little over twenty per cent of the cases in doses that varied from 600-1800 milligram hours. A number of patients were operated a second time and one or two a third time. One patient who was operated upon in 1911 died in 1930 of coronary thrombosis. He had no signs of recurrence at any time. This, so far as I know, is the only one of my patients, with a positive microscopical diagnosis of carcinoma of the prostate, who has lived more than eight years following operation, but about this patient there is a question. Although the late Dr. Arthur T. Cabot, a keen clinician, thought that the prostate both before and after removal was carcinomatous, and although two pathologists reported carcinoma on microscopical examination, we were unable to find the slides at the time that this man's continued health made it most desirable to reëxamine them. They were reported to have been destroyed when the late Dr. William Whitney's laboratory was dismantled following his death. This is the only case in which a patient has remained well practically indefinitely, but our inability to verify the pathological diagnosis of 20 years ago casts some doubt upon it.

It has been my experience that as a rule as soon as one can make a clinical diagnosis of carcinoma of the prostate, extension of the disease has already taken place and the most that we can hope is to palliate the trouble.

This is well illustrated by a patient of 60 whom I saw with a little bladder irritation in 1916. He came in occasionally over a period of three years. Sounds and mild irrigations relieved his discomfort. I then missed him for some time and, on his return, one side of his prostate was slightly suspicious. I did a perineal removal which showed adenocarcinoma. He did very well for some four or five years, but died between six and seven years after operation. A short time before his death I examined him. He had metastases in his spine, as shown by x-ray, great thickening of the crest of his right ilium, a clear but concentrated urine, nothing abnormal to be felt by rectum, no evidence of any suprapubic thickening. In this case the metastasis had taken place by the time clinical diagnosis was possible. There was no recurrence locally following partial prostatectomy.

Cases of this sort make me wonder if we are justified in doing the complete perineal removal, a more serious operation, as a routine. It is my belief that by the time we can make a clinical diagnosis that metastasis has taken place in the vast majority of patients, that all we can hope for in these cases is to relieve the retention element; that the operation which gives the patient relief from retention during his lifetime, with the least mortality, is probably the best one. It is going to require a careful study of operated cases over the next few years to determine this.

All of us, I think, have been disappointed in the use of radium as a curative agent in carcinoma of the prostate; the smaller doses give little apparent result, the big ones also seem to have little result but often make the patients very uncomfortable and may cause great harm. I think the knowledge that radium has been used gives a certain mental comfort to some patients; perhaps this may justify its occasional use.

I congratulate Dr. Smith on his valuable and interesting paper.

Dr. J. Dellinger Barney, Boston, Mass.: I should like to stress some of the points brought out by Dr. Smith and by Dr. Wilder.

In the first place, in regard to early diagnosis which is in some cases impossible, or just isn't made. It is a very important thing to make it and it is often not made because of certain difficulties such as overlying edema or because the malignant portion of the prostate is overlaid by adenomatous tissue. I think largely it isn't made, or to a certain extent it isn't made because, as I think Dr. Wilder said, rectal examination is often not a part of a routine examination.

It matters little what ailment the patient complains of, I think that a rectal examination should invariably be made as it will often throw a surprising amount of light on the condition.

If these early diagnoses could be made, undoubtedly Dr. Smith's figures of from 5 to 10 per cent of cases which were suitable for a total perineal prostatectomy would be increased. We must remember that in all cases of obstructing prostate, about one in every four or five are in men who have cancer. It is a pretty high figure. While we may not raise that figure, I think we will raise the figure of the cases suitable for the total operation, but, as it is now,

apparently there are about ninety per cent or thereabouts of men who cannot have a total perineal prostatectomy and therefore we have to do something else for them.

In many of these cases metastases already exist and where they already exist and where they can't be much influenced by x-ray or other treatment, it seems too bad to subject them to any more operative procedures than are really necessary.

As Dr. Chute has said, after all, it is a palliative procedure and whereas cystotomy used to be done and probably always will be done to a certain extent, as Dr. Wilder pointed out, the new method of resection as developed by McCarthy, Davis and others is going to be of tremendous value. I have had a very brief experience with it but in cases which have already been operated by the suprapubic or perineal route and in other cases which have not been operated, it certainly does give very extraordinary relief. Men with almost complete retention have been able to function perfectly normally and comfortably over a period of at least months. I have not done it long enough to know how much longer they will continue, but it is much less of a surgical procedure than partial prostatectomy either suprapubic or perineal, and if obstruction again recurs, it can be again removed by resection, so far as I can see.

There are certain cases of perhaps more advanced carcinoma which do not lend themselves to that method of procedure and therefore it remains only to do a suprapubic cystotomy on them.

I join with Dr. Chute and Dr. Wilder in paying homage to Dr. Smith's modesty and not only that but also his ability. I have watched the work which he has done and if you want a perineal prostatectomy, I think it could be done very well in his hands.

Dr. T. N. Hepburn, Hartford, Conn.: *Mr. President and Gentlemen*—I am still inexperienced enough to be delighted with the optimistic report which Dr. Smith has given in his paper. I think nothing is more discouraging to the urologist than to hear the almost one hundred per cent gloomy prospect which carcinoma of the prostate gives. The prospect is stressed by every man with great experience in cancer of the prostate.

Personally, I have never saved, by conscious effort, a cancer of the prostate. I have two cases reported pathologically as cancer in the routine examination at the laboratory of our removed prostates, which, however, have survived without any return for a number of years. They were still localized and made symptom-free by the removal of the adenoma.

The perineal operation as suggested by Young and reported on today by Dr. Smith, is to my mind the only scientific surgical approach by which this problem may be solved and I wish to give the result of my rather slight experience, which is that none of the cases have died as the result of the operation. These cases have been relieved of pain, I think, as compared with those drained suprapubically, though they finally died of cancer.

I wish that Dr. Smith had given a detailed report of the condition of his seventeen surviving patients, as to whether they are living a comfortable life.

I feel that the only time that we can cure these patients is when we get them early, and yet I question, in the long run, whether the getting them early may not do more harm than good to a number of individuals. The diagnosis is exceedingly difficult and if you are going to get them early enough to really cure them, I feel that many prostates are going to be removed that are not cancerous and the patient's condition may be left worse than it was before.

I should also like to give a little warning in regard to Dr. McCarthy's instrument, which is used so facilely in the hands of many urologists. It is a good-sized instrument and a bladder neck with a carcinoma of the prostate on one side or around it which will admit that instrument is a pretty wide open bladder neck. If not wide open this big instrument will start bleeding which may require a suprapubic cystotomy to remedy. I am inclined to think that a great deal of harm is going to be done to patients whose bladders are functioning, by inexperienced men trying to introduce this instrument.

If nonfunctioning, bladder necks obstructed by cancer of the prostate can be more rapidly reamed out or burnt out through a suprapubic incision. While Dr. McCarthy's instrument is a good one, it cannot perform miracles.

Dr. George C. Wilkins, Manchester, N. H.: I hesitate to thrust myself into a discussion among urologists, but I want to point out one or two obvious reasons why the radium treatment of the prostatic cancer is a failure.

In order to treat cancer successfully by radiation, it is absolutely necessary that every part of the cancer be radiated, and if you think of the anatomical situation of the prostate and the manner of your approach to it, you can see very readily that it is almost impossible to place implants or needles so that every part of that cancer tissue can be reached by radium.

Even in the hands of Dr. Dean, Dr. Barringer's assistant, and I have seen some very interesting x-rays showing the location of his implants after they have been placed in the prostate and they show apparently very good distribution, there are still areas of prostate two to three centimeters, perhaps, in width, that are not being radiated.

That is one of the principal reasons why it is very difficult to radiate the prostate and the approach must be either from the bladder or from the rectum, and the other side we cannot feel while the radium is being introduced, and if we accept that dictum that it is impossible

thoroughly to radiate the prostate, as I believe, then there is nothing left except operation and I hope that Dr. Smith's prediction will come true.

Dr. George G. Smith (closing the discussion): I think Dr. Wilkins has put his finger on one of the main difficulties with the treatment of cancer of the prostate by radium. Another great difficulty is that in my hands the degree of suffering which the patient has had from the effect of the heavy dose of radium in the prostate to the bladder mucosa has been at times terrific, and it has made me pause a long time before advocating this treatment.

Dr. Wilder has brought out very well the question of the necessity of early diagnosis. Now it seems to me that that is what we should strive for in this condition. I think if the prostate feels suspiciously hard to the examining finger on consecutive examinations, and is not inflammatory, that patient should have the prostate exposed perineally, which is not much of an operation; a section could be removed for frozen diagnosis. If that proves to be malignant, then total prostatectomy should be done. If it is not malignant, the patient could be sewed up with a drain and would probably be all right in a week or ten days.

Dr. Hepburn brings out the point whether some of these people would not be worse off if they had their prostates removed early in the course of carcinoma. I don't know in just what way they might be worse off, and whether he means from the point of view of control. In the cases that I have done, the condition of control is known in thirty-five cases. Twenty-eight of these had perfectly satisfactory control, that is, they might leak a few drops on getting up or coughing or sneezing, but they did not have to wear a urinal, and they were comfortable. In three the control was poor. Four had no control. One of those also had tabes and one was a mental case that had had a cerebral thrombosis and was mentally deficient, but in the great majority of them complete control, i.e., satisfactory control, can be expected.

In regard to the matter of cure, I have Hugh Young's figures and he says of the thirteen who are alive and free from recurrence or metastasis, six have gone five or more years since operation. Of the eleven who have died without recurrence or metastasis, five lived five or more years. He had three autopsies on cases dying one year, three years, and six and one-half years later, with no cancer discoverable.

Among those living and well, one was operated on seventeen years ago, one thirteen, two seven, and one six. Two died without recurrence nine years after operation, two seven years after, and one six years after.

My point in this whole discussion is that if we can only make the diagnosis of this condition earlier, and I think we probably have several years' leeway in which to do it, then a total prostatectomy would give these patients in some cases cure and in all cases relief because practically none of them have recurrence of urinary obstruction or any recurrence of bladder trouble afterward. They die of metastases or sometimes of local recurrence outside the bladder which impinges on the ureters, but in all except two cases out of this series, the function of the bladder was maintained without any trouble until the last day.

Of the cases that are living and apparently well, I have examined almost all by rectum and if I could feel any induration there, I put them under the heading of "living with metastases or recurrence." These seventeen had soft bladder bases and were perfectly comfortable. Some of them didn't know they had ever had a carcinoma and they were going about the pursuit of their daily work without any symptoms referable to the bladder.

ANNUAL REPORT OF THE COMMITTEE ON FRACTURES FOR THE NEW ENGLAND SURGICAL SOCIETY

1932

THE Fracture Committee of the New England Surgical Society has been quite active in the past year attempting to interest various State and County Societies in a proposed Fracture Demonstration brought to the Societies by men qualified for such work and on salary.

It is proposed to attempt to raise sufficient funds to employ two doctors full time for one year. These men are to make a tour of New England, visiting each local medical society and demonstrating by means of moving picture films, x-rays, etc., approved methods of handling some of the more common fractures of the long bones. These lectures are to be well advertised and sponsored by the New England Medical Council in coöperation with the New England Surgical Society and the various State and County Societies.

It was hoped that funds to carry on this work might be obtained from some organization like the Commonwealth Fund. The executives of this Fund are inclined to show some interest in the project but are not willing to finance it unless the various State Societies will contribute something toward the expenses and indicate their interest in this form of graduate teaching.

The Massachusetts Medical Society did appropriate $500 toward graduate teaching and approved of using this fund or a part of it for fracture teaching. The Rhode Island State Society appropriated $50 for fracture teaching. Other State Societies have the matter before them and we hope will contribute according to their financial ability.

Charles L. Scudder,
Robert J. Graves,
Arthur W. Allen, *Secretary.*

THE PHARMACOLOGY OF DIGITALIS IN RELATION TO THE THERAPY OF HEART DISEASE*

BY HENRY A. CHRISTIAN, M.D.†

THE story of the pharmacology of digitalis has much in it that is instructive to the clinician who is planning the treatment of patients with evidences of having a diseased heart. To those pharmacologists, who have done so much to unravel the several ways of action of digitalis, the clinicians owe a debt of obligation. The story of their work is a long one, and there is not time available this evening to touch on more than a few of their investigations and to show how these influence our methods of prescribing digitalis.

We give a patient a dose of digitalis by any one of several routes; in due course of absorption and circulation, the digitalis reaches the myocardium. As it passes along the coronary capillaries and through the cardiac cavities, part of it leaves the circulation and enters the cells or fibers of the myocardium. For some time nothing happens. Then changes begin to develop, changes which constitute what we term the digitalis effect and which continue with decreasing activity over long periods of time, sometimes as long as three weeks. After the digitalis enters the heart muscle for a very brief time it can be removed easily; at the end of this brief period it has become fixed in the heart muscle and by no known means can be removed. So far this digitalis has had no demonstrable effect on the heart muscle. Gradually, however, this digitalis, bound to the heart muscle, is converted into another substance, and this substance exerts a digitalis action. In producing this action this digitalis body, so far as we know, disappears, and nothing resembling digitalis leaves the heart to be excreted from the body.

The active principles of digitalis are glucosides and our pharmacopoeial preparations of digitalis contain several of these glucosides. After ingestion of digitalis, glucoside absorption and fixation by the heart muscle take place. Within the heart muscle the absorbed, fixed glucosides are gradually split into two components, one an aglykon or genin, which exerts the digitalis action, and the other a sugar, which is inert. For example, digitoxin, derived from digitalis, is split into digitoxigenin ($C_{23}H_{34}O$) and three molecules of digitoxose ($C_6H_{12}O_4$), which is a sugar. Similar cleavage takes place in other digitalis glucosides, resulting in different genins and different sugars.

The way in which digitalis is absorbed, fixed and split, as described above, has very important bearings on our clinical use of digitalis. It has been seen that there is a latent period between the administration of digitalis and any effect. This latent period always is present in whatever way we give digitalis, though it is possible to decrease the duration of the latent period by the route and rate of introducing the digitalis into the body. Furthermore, after digitalis action begins, there is a further interval, not very long, before its maximum effect. is reached. Finally when digitalis once has been given and absorbed into the circulation, it enters the heart muscle and in a few seconds is so firmly bound there that it cannot be displaced. In clinical terms this means that the effect of a single dose of digitalis cannot be judged until after a certain interval has elapsed following the administration of the drug and that, if more than is desirable is given, there are no means by which the excess can be removed from the heart muscle. There is no known effective antidote to too much digitalis other than time, which permits of the gradual utilization of the amount given. Consequently it is important in the treatment of marked cardiac insufficiency to give digitalis in a large enough dose while avoiding an excessive amount and for the first dose to give enough to obtain as prompt an effect as is possible. On this basis we treat, with digitalis, cardiac decompensation.

There has been emphasized so far that digitalis is first fixed in the heart muscle and then there split into a form that has a digitalis action and that this splitting is a gradual process continued with diminishing amount of available active digitalis substance over a long period of time. This feature of the pharmacological action of digitalis permits of a subsequent dose to be given at the time the effect of the first dose is declining and thus to restore the effectiveness of the digitalis action. This is the underlying principal of the maintenance of digitalis action in our patients over periods of days, when such is desired.

If the second dose follows the first at too short an interval in proportion to the size of the dose, the amount of digitalis glucoside fixed in the heart muscle, instead of being restored to its original level, is increased. Repetition of doses of this same size at the same interval will result now in a steady increase in the amount of fixed glucoside until a toxic level is reached. Doses repeated in this way thus become toxic, when the single dose is not toxic. This is what we call the cumulative action or effect of digitalis and explains why, after a certain period of

*Trimble lecture before Medical and Chirurgical Faculty of the State of Maryland at Baltimore, April 26, 1932.

†Christian—Hersey Professor of the Theory and Practice of Physic, Harvard University. For record and address of author see "This Week's Issue," page 99.

efficient and desirable action, toxic digitalis effects can appear with no change of dose.

Since digitalis glucoside is gradually used up by the heart muscle, when toxic effects have developed, digitalis dosage should be stopped completely until the level of digitalis fixed in the myocardium has decreased to the point of no longer producing the desired digitalis action. Then dosage should be recommenced in smaller amount or at longer intervals so as to maintain but not exceed the level of dosage which is regarded as having an optimal effect in the given patient. Such a level constitutes what we term a maintenance or continuation dose of digitalis.

Certain other observations of the pharmacologists have an important bearing on the therapeutic use of digitalis. These concern relations between the concentration of digitalis in the coronary circulation and cardiac cavities, the time of flow and the mass of the heart muscle. In isolated hearts of animals it has been shown that the amount of digitalis fixed by the heart muscle is proportionate to the concentration, the time of flow remaining the same, whereas the fixation varies inversely with the shortening of time of flow, the concentration remaining unchanged. Digitalis fixation also varies directly with increase in the mass of heart muscle.

If with an artificial circulation of blood to the heart are added to the system one by one single structures such as the lungs, the liver, the kidney and the skeletal muscles, arranged so that the blood containing digitalis flows through these before reaching the heart, the amount, if any, of digitalis taken up by these structures can be determined by appropriate pharmacological methods of investigation. It was found that if a dose of digitalis sufficient to kill the heart, when circulated directly to the isolated heart, was sent first through these other structures, with the exception of the lung which fixes no digitalis, the dose was no longer sufficient to kill the heart, because these other structures had the power of fixation of digitalis in their cells and for each gram of tissue there were certain ratios to heart fixation as follows:

	Heart	Muscle	Liver	Kidney
Digitoxin	1	1/14	1/4	1/2
Ouabain	1	1/10	1/5	1/2

As skeletal muscle bulks so large in animal and man, skeletal muscle can fix more digitalis than can the heart, though gram for gram of weight heart muscle fixes fourteen times as much as skeletal muscle. Except in the kidney, digitalis fixed in tissues other than the heart appears to exert no effect.

Now if we apply these facts in our therapeutic use of digitalis, we see at once that, if digitalis is given intravenously, since it only passes through the lung, which fixes no digitalis, en route through the heart, the heart will receive the full amount of injected digitalis and fix and utilize an amount proportionate to the concentration of it as it passes through the heart, the rate of circulation remaining unchanged, and that of what escapes from the heart into the general circulation very little, if any, ever returns to the heart because it is taken up by liver, kidney, skeletal muscle, etc. In other words the dose of digitalis used intravenously, i.e., its concentration in the blood, must be large enough to allow the heart muscle to fix the needed amount as it circulates primarily through the heart muscle, since there will be no return of digitalis after the blood enters the systemic circulation, and this amount needs to be relatively large for the time of its passage through the heart muscle is brief.

In contrast, if digitalis is given by mouth, it is absorbed and passes into the portal circulation to go through the liver on its way to the heart and pulmonary circulation. The liver by reason of its bulk fixes about as much digitalis as does the heart muscle, thus reducing correspondingly the amount of digitalis that reaches the heart muscle. Thus it should be necessary to use a much larger dose of digitalis by mouth than by the intravenous route to produce the same effect on heart action. Clinically, however, the difference needed in dosage between these two routes is not great, because another factor enters into consideration, namely the time during which the digitalis is in the circulation. This is short for digitalis given intravenously, but owing to prolonged absorption through the gastro-intestinal mucosa, when given by mouth, digitalis is in the circulation for a much longer time. Apparently these two factors, fixation by liver and prolonged time of flow of digitalis about offset each other and reduce very greatly the observed difference of effect whether digitalis is given intravenously or by mouth.

Rectal administration obviously is essentially like mouth administration in these respects and intramuscular administration like intravenous except for some local fixation by muscle before the digitalis is absorbed into the circulation when introduced intramuscularly. Were digitalis given by intra-arterial injection into the aorta a very large dose would be required, for the systemic tissues would fix a very large amount of digitalis and so greatly reduce the concentration of that getting to the heart.

As already stated, the rate of flow through the heart muscle of blood containing digitalis has an influence on fixation, the slower and more prolonged the flow the greater the fixation, concentration remaining unchanged. Clinically it has been long known that digitalis given to a patient with a heart functioning normally or nearly so, causes much less change in function than the same amount given to a patient during cardiac insufficiency. Why is this so? In cardiac insufficiency the circulation everywhere is

slowed and inefficient. This is true for the coronary as well as for the peripheral circulation. Also the emptying of the coronary circulation, including the veins of Thebesius, depends on the vigor of systolic contraction of the ventricles, and this is decreased in cardiac decompensation, some of the blood not being removed from the heart at the completion of systole but remaining in the coronary vessels and cardiac cavities. These changes prolong the time of the contact between digitalis in the circulation and the heart muscle, resulting in the fixation of more digitalis by the myocardium than when the flow of blood is rapid and the systole of the ventricles vigorous. This results in a greater digitalis effect from a given dose of digitalis during the stage of cardiac decompensation than after compensation is restored. In a way then the heart automatically adjusts itself to its digitalis needs, so as to get more effect from a given dose of digitalis when the function is poor and needing help than when function is better and less in need of a boost.

It has been pointed out that there is a direct relationship between muscle mass and fixation of digitalis; concentration and time of flow remaining unchanged, a hypertrophied heart fixes more digitalis than one of normal weight and so gets more effect from a given dose. This, too, has an influence on our methods of cardiac therapy with digitalis, giving us proportionately more effect from a given dose of digitalis when the heart is hypertrophied than when normal in size.

What effect, if any, does digitalis have on the size and efficiency of the heart, when given for a considerable period of time? At an early date digitalis was supposed to increase the work of the heart, and it was believed that such increased work would cause the heart to hypertrophy. Cloetta, however, tried this out some twenty years ago by giving digitalis to animals for months and found that in contrast to control animals not receiving digitalis the heart became smaller instead of larger. More recently he has carried out the same experiment on animals with experimental aortic insufficiency and found that in those receiving digitalis the heart showed less hypertrophy than in those not receiving digitalis; giving digitalis reduced the increase in weight of the heart with aortic insufficiency from 80 per cent to 38 per cent above that of controls without valve lesion. Cloetta's work suggests that digitalis retards cardiac hypertrophy.

Furthermore, when he tested these hearts as to their absolute reserve energy, he found that digitalis-treated hearts with aortic insufficiency were almost equal in reserve energy to the hearts with normal valves, while the untreated hearts with aortic insufficiency were much more rapidly exhausted. This indicates that digitalis had retarded detrimental effects on cardiac function.

For a long time I have held the view that cardiac hypertrophy, as we see it clinically, is an undesirable process. There are many patients who die as the result of chronic non-valvular cardiac disease, or myocardial insufficiency or myocarditis or myopathy, whichever of these terms you prefer to use, who at autopsy show almost nothing abnormal besides cardiac hypertrophy and evidences of chronic passive congestion of the viscera. One is tempted with the idea that excess size in a viscus essentially composed of a muscle layer about a cavity has caused its breakdown in function; an idea not so improbable, as at first it might seem, if you recall that as the viscus enlarges the cavity enlarges and that it requires an increasing amount of work to empty an increasingly capacious cavity against an unchanging resistance. Cloetta expressed in 1929 somewhat the same idea in these words: "Contrary to the former conception, I now consider every heart with dilatation and hypertrophy as in an abnormal state and of diminished efficiency. As a result of experimental investigations, I now understand that a dilated and hypertrophied heart encounters greater difficulties, as the demands on it increase, than the heart of normal size, mainly because it is unable to count on 'physiologic' adaptation for overcoming the extra work; its power of adaptation is decreased."

Cloetta's animal experiments and these ideas as to the disadvantages of cardiac hypertrophy lead to the conclusion that digitalis is a desirable remedy to apply to patients with enlarging hearts, even before they show any evidences of decreasing function. The old idea of a "tonic dose" of digitalis has a new support, though by tonic I would understand larger doses of digitalis than our predecessors applied as tonic doses, doses of 0.1 to 0.15 of a gram of powdered digitalis leaves or 1 to 1.5 cc. of tincture of digitalis per day.

There is evidence that digitalis is more effective in older than in younger patients. This relates to the varying water content of heart muscle at different ages and the hydrophilic effect of digitalis. So I am inclined to advise this use of digitalis before there are symptoms not for children but for adults, particularly for adults past forty years of age, and especially those still older, in whom some enlargement of the heart can be detected, or, if not detected, can be anticipated by reason of evidence of organic valve lesion or of the presence of hypertension. If it is indicated, when there are no symptoms but only evidences of beginning cardiac enlargement, it is all the more to be recommended for patients with slight breathlessness on exertion and particularly in the older ranges of age. Digitalis under these circumstances is a medicament to be used daily, day in and day out, for the rest of the patient's life. If digitalis will serve to retard the development of cardiac enlargement, most probably it will act

to maintain an efficient circulation for a longer time than will be the case if the use of digitalis is limited to patients with obvious cardiac decompensation. A long clinical interest in cardiacs has convinced me that, once decompensation has developed, best results are obtained from a daily digitalis ration maintained continuously thereafter. A shorter period of observation of the effects of a daily digitalis ration begun before there are any evidences of cardiac insufficiency in patients in whom cardiac insufficiency may be reasonably expected, and particularly in those in whom cardiac enlargement can be detected, makes me believe this to be a worth-while procedure. Certainly I can see no reason to believe that, in any wise, injury can result from such use of digitalis.

In my earlier clinical work I came to use pills of powdered leaves of digitalis and found this a very satisfactory preparation of the drug. A short time ago I looked up the record of the treatment of the cardiac patients admitted to my care at the Peter Bent Brigham Hospital twenty years ago when that hospital was opened and found that they were given pills containing 0.09 gram of powdered digitalis leaves at varying time intervals. From time to time other forms of digitalis have been tried out, but always I have returned to pills of powdered leaves as fully as satisfactory in efficiency for mouth dosage as and cheaper than other digitalis preparations.

In closing, let me leave with you the idea that for mouth dosage to date no digitalis preparation on the market is better than pills of powdered leaves, judged either on the basis of clinical experience or of pharmacologic investigation. How long this statement will be maintained is contingent on the fruits of investigations not yet made.

RELATIONSHIPS BETWEEN EMOTIONAL STATES AND ORGANIC DISEASE*

MAURICE FREMONT-SMITH, M.D.†

EVERY physician recognizes the existence of symptoms produced by emotional strain. The significance of these symptoms, however, is very differently interpreted by psychiatrist, internist and physiologist.

To the psychiatrist, functional symptoms represent an escape mechanism through which the patient finds justification for past failure or reason for withdrawal from future situations which hold for him an element of danger. For the psychiatrist the little boy's stomach-ache in the early school-morning represents a mechanism, unconsciously produced, which if successful eliminates the necessity of school for that day. Its purpose accomplished, the symptom disappears. From this point of view every emotionally produced symptom is an excuse. Although for secondary reasons the type of symptom presented would interest the psychiatrist, his essential emphasis would be laid on the possible advantage to the patient resulting from the symptom.

Until recently the physician has in his turn overemphasized the "organic"—one might say the "anatomic"—aspect of the picture. He has divided his cases into compartments according to the organ chiefly affected, labeling some "nervous stomach", others "nervous heart", etc. Although he has taken some interest in the physiology, and has studied his cases by x-ray, gastric analysis or electrocardiogram, gross defects disproven, his interest has often waned both in the organ under investigation, and, too often, in the patient himself. "There is nothing wrong", he has said; "Go away and forget it" (and parenthetically he has added "in any case, *go away!*").

For the past twenty years a few physiologists have been asking themselves whether anything happens to the organs of the body in the presence of emotional tension and have brought evidence to prove that under emotional stress a change in organic function does take place.

I will refer very briefly to a few observations by Pavlov and Cannon and their collaborators which prove that there exists a direct relationship between emotional states and the function of bodily organs.

Pavlov as is well known prepared dogs in such a way that the parotid secretion could be collected and measured. When such a dog was shown food, the parotid began to secrete, and the rate of secretion could be quantitatively determined. He then developed in these dogs what he called a conditioned reflex. That is, on every occasion that food was presented to the dog, he rang a bell. After a certain number of repetitions of this maneuver, it was found that the dog secreted saliva whenever the bell was rung even though no food was shown. The response finally became invariable and could be elicited even after weeks of disuse. The mere ringing of the bell would cause a flow of saliva and this flow would take place always at a constant rate.

In 1924 there was a great flood in Petrograd, and the dogs were rescued from the laboratory with difficulty. Ten days later when these dogs were tested for their conditioned reflex, it was

*Read at the meeting of the American Climatological and Clinical Association at Atlantic City, May 6, 1932.

†Fremont-Smith—Assistant Physician, Massachusetts General Hospital. For record and address of author see "This Week's Issue," page 99.

found to have completely disappeared. Before the flood they had invariably responded to the stimulus by the secretion of saliva; after the flood the reflex had ceased. Pavlov found that if an experimenter with whom the dogs were familiar stayed in the room with them, the conditioned reflex would to a limited extent return; the sound of a stream of running water outside, however, immediately inhibited the reflex[1].

We have here evidence that an organ which responds under normal conditions to a certain stimulus, may be through fear entirely inhibited. Pavlov was able to show by another experiment that not only fear, but other emotional strains may act as inhibitory stimuli.

A certain tone was made a conditioned food stimulus by its repeated simultaneous application with food. The dog would now always respond to this tone by the secretion of saliva. At first other tones differing not greatly from the original would also call forth parotid secretion; but by repeatedly showing food while the original tone was sounded, and never accompanying the slightly different tone with food, the dog could be trained so that there would always be a response to the original tone (1000 vibrations per second) and never any response to the second tone (1012 vibrations per second). It was found, however, that this second tone produced not only *no* response, but had an actual inhibitory effect. In the experiment with the dog Dogonyai[2] when the positive tone (1000 vibrations) was sounded the parotid secreted 4 drops of saliva per half minute. This response was repeated and invariable. Then the negative tone (1012 variations) was sounded. There was no response. Five minutes later the negative tone was repeated; again no response. Ten minutes later when the positive tone was again sounded only one drop of saliva per half minute was secreted, and 19 minutes later only 3 drops.

When a tone quite different from the positive conditioning tone was used as a control, no inhibition was observed. For example, in another experiment at 1:20 the positive tone resulted in 5 drops per half minute. A negative tone (differing by two whole tones from the original) at 1:40 gave no response; again at 1:44, no response; but at 1:54 the positive tone gave the normal response of 4 drops per half minute, and again a normal response at 2:10.

Pavlov says "thus we see that a fine differentiation (the negative differing by one eighth note) caused an intense inhibition, but a coarse differentiation (the negative tone differing by two notes) did not evoke any marked inhibitory effect".

The first experiment (performed immediately after the flood in Petrograd) demonstrates that during states of anxiety a stimulus which before caused a positive reaction (flow of saliva) ceases to be effective. The second (the experiment of the two almost identical musical tones) shows that such a state of inhibition may be induced not alone by danger, but by a situation of strain, in this case the result of the very great difficulty in differentiation. It is not necessary to emphasize the "organic", i.e., physiological nature of the change that has been produced. In the one case the parotid secretes; in the other there is no secretion.

As you all know, Cannon and his collaborators have demonstrated other changes in bodily function to be the result of emotional states. Changes in gastric motility and secretion, in blood sugar, in adrenalin content of the blood, in blood pressure and other functions have been shown to follow or accompany states of fear, anger, etc.[3]. Many of these changes are apparently associated with an overstimulation of the sympathetic portion of the autonomic nervous system. May even more fundamental or more permanent changes such as those which we physicians are accustomed to label "organic", also be the result of emotional states, acute or chronic? Cannon himself raises this question and quotes a number of cases of hyperthyroidism, reported by Marañon, which apparently followed immediately upon acute emotional episodes. Cannon feels it is quite possible that certain organic diseases may be the result of immediately preceding acute emotional trauma.

Draper[4], in an interesting paper, reports a number of cases of gastric and duodenal ulcer in individuals evidently suffering from chronic states of emotional tension, and believes that in several instances not only did the patients show clinical improvement (without change of diet) following relief of the emotional stress, but in certain cases showed x-ray evidence of healing of the ulcer. He cited three cases of chronic ulcer, in which gastric hemorrhage occurred within a few hours following acute emotional storms; and Chester M. Jones[5] has seen a number of hemorrhages following acute emotional episodes in cases of chronic peptic ulcer.

The following two cases are illustrations of an apparently related mechanism.

During the fall of 1929 there was under my care a stockbroker 49 years old (Case 1824) who had had for 20 years symptoms of duodenal ulcer. The diagnosis was confirmed by x-ray. When first seen he was having typical hunger pains relieved by food or soda. Physical examination was negative—Wassermann negative. On frequent feedings the pain was only partially controlled, and in September, 1929, he was hospitalized. With rest and control of nocturnal gastric acidity, he became symptom-free. On the afternoon of October 29, he was in bed symptomless. He was brought the evening newspaper. As he read the headlines describing the stock-market panic, his ulcer pain suddenly reappeared, and was present when I visited him two hours later. The pain was so characteristic and appeared after so long a period of well-being that some causal relationship between ulcer symptoms and emotional tension seemed evident. On further questioning the

patient stated that on several occasions after an evening of family tension, his nocturnal pain had been more severe. This patient has had both psychiatric and physical treatment and for two years has been symptom-free.

A similar case (Case 2278) was first seen last fall. This was a man of 39, single. A diagnosis of duodenal ulcer had been made by another physician and confirmed by x-ray. The patient stated that the ulcer usually troubled him during the winter when his schedule became heavy, and also when he was under emotional strain. He complained of phobias, of feelings of panic and of feelings of guilt.

In brief his story was this: Brought up by a domineering aunt, he had been early discouraged and as a reaction to this discouragement had developed an exaggerated ambition with its accompanying fear of failure. He had become a perfectionist, and took his responsibilities and mistakes over-seriously. He believed he wanted to marry, but in spite of numerous abortive attempts to make a real friendship with a woman, he had never "found the right girl". It was evident that marriage was one of the many things he feared, and he was unconsciously steering a course which would lead away from rather than toward marriage. His first attack of epigastric pain came on six years before, during a period of hurry and strain connected with a business trip. He would have pain for two hours after meals during periods of acute strain. But he told me that his ulcer symptoms had no close relation to food; that at certain times he could go for eight hours without food and experience no pain. If, however, he felt pressed by more work than he thought he could accomplish, or when annoyed by some even trivial occurrence, he might feel the ulcer pain within 60 seconds. The mere thought that he might not get his work done was sufficient to bring on gastric symptoms. During a period of real mental depression under my observation, no ulcer symptoms occurred.

This man has been under observation seven months. He has much greater insight into his difficulties, and consequently far less sense of emotional strain. Although his diet has not been modified, at the present time if he gets enough exercise and keeps his work up to date he is symptom-free.

Cases such as these indicate that there can be a definite relationship between states of mind and ulcer pain. If freedom from symptoms denotes healing, or, if the converse at least be true, that the presence of symptoms denotes activity of an existing ulcer, then all factors which tend to cause symptoms are detrimental and their elimination must be included in any plan of successful treatment. Just as in certain cases of angina where moderate exercise may well be tolerated, while emotional irritability may bring on an attack, so in some cases of peptic ulcer emotional tension may apparently be more harmful than neglect of dietary restrictions.

Possibly neither the psychiatrist on the one hand, nor the clinician on the other, has sufficient appreciation of the real changes in the function of organs that accompany emotional stress, and stress sometimes of apparently very minor degree. The amount of conscious anxiety in fact may be no indication of the degree to which bodily function may be disturbed. Whether peptic ulcer or other so-called "diseases" such as angina, epilepsy, migraine, Raynaud's or Graves' disease may be actually caused by the changes in physiology brought about through emotional states, I do not know. I do believe, however, that in neglecting the emotional aspect in the treatment of many organic conditions, the clinician is overlooking an important, even a fundamental method of therapeusis.

REFERENCES

1 Pavlov, I. P.: Lectures on Conditioned Reflex, 1928 International, p. 363.

3 Cannon, Walter B.: Bodily Changes in Pain, Hunger, Fear and Rage. New York, D. Appleton & Co., 1929.

4 Draper, G., and Touraine, G. A.: Man-environment unit and peptic ulcer. Arch. Int. Med. 49: 616 (Apr.) 1932.

5 Personal communication.

CONSIDERATIONS ON PROTEIN AND SALT THERAPY IN THE VARIOUS TYPES OF BRIGHT'S DISEASE*

BY ALLAN M. BUTLER, M.D.†

TO discuss therapy in Bright's disease in twenty minutes one must resort to simplification. Because many complicating factors encountered in practice are conveniently passed by does not mean that their existence is not appreciated. This paper attempts merely to present a rational basis from which to view the treatment of actual cases.

The importance of the structural changes in the kidney in the various types of Bright's disease in diminishing the kidney function is familiar to all. We know so little about the cause and control of such lesions that we cannot for the present consider their treatment per se. We must rather direct our attention to factors other than kidney structure effecting the excretion of metabolites.

A brief statement of our present conception of kidney function will indicate what these factors are.

As a result of the work of Starling[1], Cushny[2], Richards[3, 4, 5], Rehberg[6], and others we can consider the main processes of urine formation as the filtration by capillary pressure against colloid osmotic pressure of a plasma ultrafiltrate across the glomerular membranes to the lumen of the renal tubules where reabsorption modifies and concentrates the glomerular filtrate to

*From the Department of Pediatrics, Harvard Medical School, and the Infants' and Children's Hospitals, Boston.

Read before the combined meeting of the Pediatric Section of the New York Academy of Medicine, the Philadelphia Pediatric Society, and the New England Pediatric Society, October 15, 1932, Boston.

†Butler—Clinical Assistant Physician to the Children's and Infants' Hospitals, Boston. For record and address of author see "This Week's Issue," page 99.

urine.* Richards and Schmidt[7] have shown that the part played by the glomeruli is not entirely that of a passive filter by demonstrating that the number of functioning glomeruli and the number of open capillary loops in each glomerulus are continually changing. Rehberg has also shown that reabsorption by the tubules is both by back diffusion and active reabsorption. Thus each kidney element can be considered to work actively.

With such a system urine formation depends not only on adequate glomerular and tubular surface and permeability, largely structural factors with which we, as stated, are not here primarily concerned, but also depends at least on (a) the filtration pressure, (b) a circulation to the kidney cells adequate to enable them to perform work, (c) the volume of plasma reaching the glomerular membrane, (d) the plasma colloid osmotic pressure, and (e) the concentration of filtrable substances in the plasma. In the main then we can, with fair accuracy and considerable simplification, say that the adequacy of kidney function will depend on the circulation (i.e., heart action and capillary behavior), the composition of the blood, and the load of metabolites per unit of functioning kidney tissue presented for excretion.

With this introduction we can proceed to a consideration of therapy in the various types of Bright's disease. Thanks to Volhard and Fahr[8], Addis[9, 10], Van Slyke[11], Blackfan[12], and others, an accepted classification of Bright's disease has come into such general use that reference to a type clearly specifies the clinical picture and pathology.

1. Initial Hemorrhagic Nephritis

The most important reactions to combat in initial hemorrhagic nephritis are those producing the cerebral symptoms and oliguria. We lack a definite understanding of the mechanisms of either. Volhard[13] believes that a toxic substance accumulating in the blood stream produces the cerebral symptoms and that a spasm-like constriction of the renal capillaries causes the oliguria. Whether the latter is affected by this same toxic substance or by an allergic reaction we do not know. Whatever the mechanism of these reactions, the clinical observations of Blackfan and co-workers[14, 12] have shown that cerebral edema is probably the immediate cause of the cerebral symptoms and that the severity of these symptoms is paralleled by the blood pressure. These workers have established effective control of the blood pressure, edema, and symptoms by the intravenous or intramuscular administration of magnesium sulphate. The details of such therapy are available in their publications. Suffice it to say here that oral administration of magnesium sulphate supplements its parenteral use. Such therapy prevents the serious and frequently fatal cerebral accidents which in children caused an eight per cent mortality in this type of Bright's disease. Fortunately intravenous or intramuscular magnesium sulphate therapy results in lessening the oliguria. Intravenous hypertonic glucose similarly favors a diuresis. During the days of cerebral symptoms or their threatened appearance, headache and nausea favor anorexia and there is little danger of eating food that will permit the retention of undesirable metabolites. In this period attention should be directed to seeing that sufficient calories largely in the form of carbohydrate or glucose are made available, so that the energy requirements do not catabolize tissue. The fluid intake should be guided by two considerations. First, where edema is present and the acute symptoms are referable to cerebral edema, the giving of sodium chloride as physiological saline seems contraindicated until proved otherwise. Secondly, severe dehydration should be avoided as this, coincident with poorly functioning kidneys, may produce undesirable effects. Aldrich[15] believes that he has observed such results from a too limited fluid intake during magnesium sulphate therapy. So long as edema fluid is being drawn into the blood stream by the magnesium therapy, there is probably little danger of this kind. Observation of the loss in weight is desirable.

With the disappearance of the acute stage of this type of nephritis the kidneys assume a fairly good function and there seems no reason to limit the diet or fluid intake in any way other than to meet the patient's wishes. Recovery will be a matter of weeks. The disease is accompanied by loss of plasma proteins and fall in red blood cells and hemoglobin. The diet should be such that these deficiencies are replaced. The low protein low salt* diets so frequently used in the past almost certainly do more harm than good.

2. Terminal Hemorrhagic Nephritis

This phase of hemorrhagic nephritis is treated next as the discussion of the latent or chronic stage is simplified by delaying its presentation till after the treatment of the terminal phase of hemorrhagic nephritis and nephrosis has been indicated.

As the termination of this phase in childhood usually† occurs when the kidney function becomes inadequate to the metabolic demands, our attention must be directed to limiting the pro-

*There is evidence that certain substances may be actively secreted by the tubule cells from the blood to the lumen of the tubules. Ordinarily this process, if occurring, would play a small rôle.

*The word "salt" is used throughout this paper to mean NaCl.

†Though death from cerebral hemorrhage or heart failure occurs, deaths from these causes in children are few compared with those from uremia. Particularly is this so, if cases of essential hypertension are excluded from those of terminal hemorrhagic nephritis. Arteriosclerotic nephritis is rare in childhood and for that reason is not considered in this paper.

duction of harmful metabolites and facilitating their beneficial elimination. Because of the required brevity of this paper, treatment of the heart is not considered. This does not mean that such therapy is unimportant.

In this stage of the disease the diminished number of functioning units must perform an unusual amount of work. Let us examine for a moment the conditions under which they are asked to do this.

Because of reduced glomerular surface the production of metabolites exceeds their excretion and nitrogen, phosphate, and sulphate retention results. As the concentration of these elements in the plasma is elevated, their excretion rises. Thus, at some particular plasma level, excretion becomes such that a balance is established. Even before the rise in these blood constituents, there is a so-called tubule diuresis, because of the reduced number of tubules due to structural damage. This, as shown by Marshall[16] and Carr[17], is accompanied by impaired reabsorption resulting in a diuresis of substance as well as water. But the elevation in N.P.N., etc., sets up a further diuresis, for the process of reabsorption is one of work against the total osmotic pressure of the glomerular filtrate, which rises with the elevation of filtrable substances in the plasma. Hence the limit of the concentrating ability of the tubules is reached with the absorption of less water than would occur under normal blood concentrations, and more polyuria than already produced by the structural damage results. Volhard's term "obligatory polyuria" indicates the total process much better than the commonly used term "compensatory polyuria". With the decrease in concentration, less of the filtered substances are reabsorbed except where chloride and sodium are being actively reabsorbed. Since the sodium and chloride concentrations in plasma are very much higher than those of other inorganic constituents, their active reabsorption to prevent a large loss must be very great. The kidneys we are discussing are markedly handicapped in meeting this excessive demand. A third factor in the loss of base is the fact established by Gamble, Blackfan and Hamilton[18], Linder[19] and others that this type of nephritic does not save base by ammonia production, so that the elimination of acid carries more than the normal amount of base into the urine. As a result of these various mechanisms, chloride and base, including sodium, tend to be lost from the body as shown by Peters and co-workers[20], Hartmann and Darrow[21], Atchley and Benedict[22], and Briggs[23]. As the renal lesion progresses these factors tend more and more to draw water and salt from the body. Thus edema in the absence of heart failure is much less common in terminal nephritis than in the stages where kidney damage is less extensive.

The physiological mechanisms and clinical evidence clearly indicate that, while metabolites such as N. P. N., phosphate and sulphate should be reduced in these patients, base (particularly sodium) and chloride should be provided in amounts adequate to prevent depletion. Since the disease is chronic and accompanied by wasting, a protein sparing high caloric diet, i.e., high in carbohydrate and low in protein, should be given. A large fluid intake promotes urinary nitrogen elimination. Holten and Rehberg[24] have reported marked improvement in kidney function following the institution of such a régime. Sodium chloride, 2 to 5 grams* per day, should be added to compensate for the loss of base and chloride. Often, and always when acidosis is present, small amounts of bicarbonate are indicated. Ellis[25] has called attention to the nephritic's inability to handle much bicarbonate and care must be taken against its excessive administration.

The therapeutic use of sodium chloride and sodium bicarbonate in this connection necessitates a few words. Our problem here, as in many other conditions†, is one of inorganic salt depletion and acidosis of varying degrees. With salt depletion goes, of course, loss of body water. We have mentioned the mechanisms of salt, including sodium and chloride, loss. Acidosis tends to favor dehydration. To replenish the sodium and chloride depletion and thus supply elements essential in relatively large amounts for the volume restoration of the interstitial and plasma fluids, sodium chloride is given. This in solution (and no matter how given it speedily passes into solution and to be retained must of course be in solution) is neutral, and the ratio of sodium ions to chloride ions is 1 to 1. But the normal interstitial and plasma fluids have a pH of 7.4, i.e., are slightly alkaline, and the ratio of sodium ion to chloride ion in these fluids is normally 1.4 to 1. Hence the giving of large amounts of sodium chloride might be expected to cause a hyperchloremia and acidosis unless the kidney excretes chloride ion in excess of sodium ion. This, we have seen, the kidney in terminal nephritis cannot do efficiently. That such retention and acidosis do occur has been shown by Hartmann[26] and Peters[20]‡. In so far then as retention of this excess chloride ion causes acidosis, or in so far as the excretion of this chloride ion causes excretion of sodium along with it (either one or both of which happen when the kidney function

*Peters[20] recommends from 5 to 7 grams of added NaCl for adults.

†The outstanding exception accompanies gastric vomiting, where the excess loss of HCl over NaCl results in a greater depletion of Cl— than Na+. Here physiological saline parenterally is almost ideal.

‡The apparent reason for this occurring more frequently than dilution of the blood and maintenance of normal chloride is the readiness with which chloride displaces bicarbonate. Dilution would cause a large fall in total base or the utilization of some base other than sodium, either of which would seem to put a severe strain on the organism.

is diminished), the giving of large amounts of sodium chloride alone is not ideally effective. By the simultaneous administration of such an alkaline salt as sodium bicarbonate, the acidifying effect of sodium chloride and the necessity of excreting chloride ion can be prevented. A simple calculation shows that the accomplishment of such a result by bicarbonate administration, assuming approximately complete and simultaneous absorption of both sodium and chloride, requires roughly 0.5 grams of sodium bicarbonate for every 0.85 grams of sodium chloride given. In giving 2 to 5 grams of sodium chloride in the food, one should then give roughly 1 to 3 grams of sodium bicarbonate. Such therapy theoretically would favor the retention of from 300 to 800 cc. of fluid. These considerations may remind one of the so-called neutral or alkaline ash diets of Sansum[27], but, when it is remembered that the base of such diets consists largely of potassium and not sodium, the lack of applicability of such diets to the needs is obvious. If sodium chloride is being administered parenterally, the above calculation shows that but 0.5 grams of sodium bicarbonate are required for each 100 cc. of physiological saline. If both salts are given intravenously, theoretically enough water should be added to the 0.85 per cent sodium chloride solution with the sodium bicarbonate to bring the total concentration of sodium to approximately 150 milli-equivalents* per liter. That is, 40 cc. of distilled water and 0.5 grams of sodium bicarbonate should be added to each 100 cc. of physiological saline. If the saline is given by clysis, the bicarbonate can be given intravenously with 10 per cent glucose. The amount of glucose should roughly be about 40 cc. for each 0.5 grams of sodium bicarbonate. This solution is hypertonic until the glucose is oxidized and as such supposedly aids in the absorption of the clysis. It further acts as a diuretic which is helpful, if not excessive. But large amounts of glucose by producing an excessive diuresis will tend to carry salt from the body and diminish the efficacy of the therapeutic measures.

The above figures are not given with the intention of suggesting scientific accuracy. That indeed would be pseudo-science. They are given in order to present the order of magnitude of doses and methods of giving sodium chloride and sodium bicarbonate. As we compare effective dosage of sodium bicarbonate to the commonly used dosage in the days before bicarbonate therapy fell into disrepute (6 to 12 grams intravenously plus 10 to 20 grams by mouth per day to infants) it seems fair to suggest that, had the effective dosage in morphine or digitalis therapy been proportionately exceeded, their usage, too, would be suffering today from a similar phase of ill-repute. Wakefield and Keith[28] have reported cases showing the ill effects of excessive amounts of sodium chloride. How often in giving sodium chloride does the physician forget that enough of a good thing is sufficient! The happy availability of appropriate simple medications seems no justifiable excuse for their careless administration. Mention of this would not be made here, except for the fact that such unwise usage may be responsible for discontinuing the proper usage of effective therapeutic agents. I cannot refrain from referring as an example to the wide discontinuance of bicarbonate therapy in diabetic acidosis, and hence the neglect of an undoubtedly effective therapeutic agent when properly, instead of improperly administered.

Recently Briggs[23] has advocated the use of calcium carbonate in terminal hemorrhagic nephritis to reduce the serum phosphorus and permit the elevation of serum calcium. It is too soon to judge the results.

Much wiser attempts to regulate the patients' intake to compensate for the kidneys' inability to do so can be made today than a few years ago. With an appreciation of the inadvisability of prescribing the so commonly prescribed low protein low salt diets for these patients, their treatment and condition are markedly improved. In these patients, as mentioned, cardiac function is important, but cannot be discussed here.

3. LIPOID NEPHROSIS*

From the pediatrician's experience there can be little doubt as to the existence of this condition as a clinical entity. Its positive and negative characteristics have been nicely summarized by Leiter[29]. We know very little about the pathological causes of this clinical syndrome, including the albuminuria and lipemia. That lack of knowledge indicates in itself the need for thinking of something other than terminology. The term nephrosis is the shortest possible way of designating this specific clinical syndrome.

The kidneys alone cannot be responsible for the retention of the edema fluid, unless they prevent filtration or reabsorption of water, sodium, and chloride in a peculiarly selective manner. The low plasma proteins to which we attribute the tendency for fluid and salt to pass from the blood to the interstitial spaces might be expected by the same argument to result in excessive glomerular filtration. Holten and Rehberg[24] have reported normal filtration figures. If excessive glomerular filtration should occur, the concentrated urines produced in this condition must accompany abnormally active re-

*1 milli-equivalent of base or acid = 10 cc. of N/10 base or acid. The advantage of using such units, in describing body fluid concentrations where positive and negative charges are balanced, is obvious. When results are expressed as grams per cent, there is no easy way of picturing them in their acid base relation. The extreme of inconvenience results from converting chloride milli-equivalents determined by analysis to grams per cent of sodium chloride, as the chloride may have no connection whatever with sodium.

*Cryptic degenerative Bright's disease—Addis.

absorption. Wolbach and Blackfan[30] have described an acute degenerative process in the tubules* in this condition, and for that reason have designated it as acute tubular nephritis. Should such a process in the tubules impede the passage of fluid, there would tend to result an increased reabsorption of water, sodium, and chloride above other substances. On the other hand, Hawkins, MacKay, and Van Slyke[36] have attributed the frequently observed glycosuria in this condition to reduced reabsorption by the tubules. For the present, then, the evidence concerning reabsorption is too meagre to warrant conclusions, and an extra-renal explanation of the edema seems likely[37, 31, 13, 38, 32, 34, 30, 29].

With this limited understanding of the pathological physiology, we can only guide our therapeutic endeavors by certain definite findings.

First, Van Slyke and co-workers[11] have shown that a plasma protein concentration below 5.5 per cent in untreated patients is usually accompanied by edema. Where, as in nephrosis, many grams of protein, identified as plasma albumin and globulin†, are lost per day in the urine, the mechanism of plasma protein production must be taxed. At any rate the concentration of the plasma proteins is often far below the edema level. As the ease with which the edema can be controlled is inversely proportional to the fall in these proteins, measures should be taken to favor their production and raise their concentration. Transfusion accomplishes the latter and is sometimes of great benefit where the edema is extreme. The effect being temporary, however, a régime permanently counteracting the loss of protein must be established. We know that a protein deficient diet favors a low plasma protein and so-called nutritional edema. Kerr, Hurwitz, and Whipple[41] showed that regeneration of the plasma proteins in dogs following plasmapheresis is stimulated by a meat diet. Hence a high protein diet as recommended by Epstein[42] seems indicated. Peters and Van Slyke[43] recommend approximately 1.5 grams of protein per pound. The fat should not be lowered at the expense of calories lest the protein in the diet be used for energy rather than for replacement purposes. Experience in pediatrics shows that the attempt to insure a certain protein and caloric intake may have disastrous results unless done with great care. A too rigidly prescribed diet will often cause the refusal of food. It seems best, therefore, merely to prescribe as much protein as the child will take willingly and to encourage, but not force, an adequate caloric intake.

Success in raising the plasma proteins on such a diet will be a matter of months. For one thing a great deal depends on protein excretion. Here it must be remembered that the amount excreted in the urine is not the essential, but rather the balance between intake of proteins and output. In the meantime the incapacitating and septically dangerous edema should be combated.

Diuretics may be tried, sometimes with benefit but more often without. In this clinic we most commonly use one of the acidosis producing salts. If such a salt is given in such amount as to actually lower the plasma CO_2 to thirty volumes per cent within five or six days, a diuresis may be effected. Urea sometimes works. Mercurial diuretics would seem to be contraindicated. Transfusion has been mentioned. If the abdomen is markedly distended by the peritoneal edema, paracentesis is often beneficial. The withdrawal of fluid in this manner not only causes symptomatic relief, but frequently is followed by the initiation of a prolonged diuresis.

The consideration of salt and water intake brings us to the second definite physiological finding of therapeutic significance. Sodium and chloride retention are essential to the retention of interstitial edema fluid such as the edema of nephrosis. This does not mean that they are to be considered as causative factors. The composition of interstitial edema fluid is such that even small retentions of other inorganic ions in interstitial compartments demand relatively many times greater retention of sodium and chloride. This being so a restriction in sodium and chloride intake can be used much more effectively in limiting the extent of edema formation than restriction in intake of other substances with the exception of water. Water being the third constituent of edema present in high concentration may likewise be used as a limiting factor. It is my belief that it is far better for the comfort and health of the patient to attempt the limitation of salt rather than water. Salt deprivation in these patients does not produce the craving that it does in the terminal nephritic. On the other hand fluid restriction often results in discomfort and loss of appetite. The vulnerability of either procedure is the degree of restriction necessary for effective therapy. In children one hesitates to restrict the milk intake over long periods, and, as milk has a considerable sodium chloride content, rigid salt limitation cannot be lightly considered. By giving viosterol and thus increasing calcium absorption, milk can be used more effectively and hence in less quantity than otherwise. The high protein, of course, takes care of the phosphate needs. One then sees that salt-containing foods

*Fahr's[31] separation of nephrosis as a pathological entity in which the renal lesion is characterized by tubule changes without inflammatory glomerular changes is accepted by Aschoff[32], Löhlein[33], Löwenthal[34], and Fishberg[35].

†Epstein's[38] present explanation of the nephrosis syndrome suggests a qualitative change in the plasma proteins, not detectable by our rather crude chemical methods, but sufficient to make them unsuitable for their metabolic rôle. As a result these abnormal proteins are excreted by the kidney. The low basal metabolism, abnormal cholesterol metabolism, and renal tubule changes apparently follow the disturbed protein metabolism. The underlying cause of this latter remains unknown. Within the limited accuracy of present methods Hewitt[39] and Hiller, McIntosh, and Van Slyke[40] have identified the urine proteins as plasma proteins.

other than meat and milk are not fed and that no salt is added in the cooking or flavoring of the diet.

While the patient is edematous, infection is always a source of danger. This should be guarded against by whatever methods possible. Special attention should be given the edematously stretched skin so likely to become injured in the bed-confined patient.

This is not the place to discuss whether the thyroid pathology reported by several workers[44, 45] is a primary or secondary part of the condition. Favorable results following thyroid or parathyroid medication have been reported by various authors[46, 47, 44, 48, 49]. The effectiveness of such therapy is, however, doubtful. Should such medication be tried, great care must be taken lest the general state of the patient suffers further depletion.

Foci of infection should always be carefully sought for and if found removed.

4. LATENT AND CHRONIC ACTIVE HEMORRHAGIC NEPHRITIS

In the Addis classification of Bright's disease the stages following an initial hemorrhagic nephritis, when recovery does not follow the initial stage*, are the latent and chronic active stages. Frequently these two stages, which may be considered as between the initial and terminal stage, are called mixed nephritis or the nephrotic type of glomerular nephritis. The intermediate position indicates a transition of symptoms and pathology from the initial to the terminal hemorrhagic nephritis pictures. The last two clinical classifications indicate a mixture of nephritis and nephrosis symptomatology. This being so a discussion of therapy is difficult, because of the wide variations from any particular combination selected for discussion. Considerations in the treatment of initial hemorrhagic nephritis and terminal hemorrhagic nephritis and nephrosis have been given at some length. These considerations enable one to devise a logical treatment of the latent or chronic active case according to the predominant characteristics of the particular patient. How can one advise a balance between a high protein low salt diet for the building up of the plasma proteins to resist edema formation and the low protein liberal salt diet for the prevention of nitrogen retention and salt depletion, unless the exact tendencies to edema and nitrogen retention are accurately specified? The fact already stated that retention tends to prevent edema tends to reduce complications of treatment from this particular viewpoint. Likewise, in a paper of this length, we cannot discuss the differentiation of the acute exacerbation with pseudo-uremic cerebral symptoms from the sudden onset of true uremia. By reference we can merely indicate the problems. The wise application of therapeutic procedures depends largely on the physician's diagnostic ability. Even then the optimal combination of therapeutic measures is often extremely difficult. To attempt a more detailed discussion without a patient seems futile.

*In children recovery from an initial hemorrhagic nephritis is the rule.

CONCLUSIONS

The preceding remarks call attention to the importance of differential diagnosis of the types of Bright's Disease. A careful history and physical examination (this covering of course the heart, blood pressure, and eye grounds) a careful semi-quantitative examination of the urine for albumen, cells and casts, and an accurate test of the kidneys' ability to dilute and concentrate urine permit such a diagnosis. The many quantitative kidney function tests, blood analyses, and balance studies made by investigators, permit us by such simple procedures, as enumerated in the previous sentence, to make accurate differential diagnoses.

Helpful as many laboratory analyses are in following the course of the disease and effect of therapy, many of them are difficult to do in private practice. Fortunately we can get much information by simple methods. The blood pressure in initial hemorrhagic nephritis and often in other types is more significant than several N.P.N.'s. Ordinary concentration and dilution tests indicate the extent of the renal lesion. Careful examinations of the urine sediment and albumin give information concerning the change in character of the lesion. An accurate record of the daily urine volume with simultaneous specific gravity and qualitative albumin determinations tells much about the elimination of fluid and substances. If we add to the information obtained by such simple procedures, a knowledge of the patient's food, salt, and water intake, and his change in weight, much can be learned concerning both their total loss or retention in the body and the concentration of constituents of the blood. An understanding of the effect of concentration of substances in the blood on urine composition, where renal damage is present, enables us by approximate analysis of the urine to estimate the concentrations of blood constituents.

Unsatisfactory as many of the investigations on Bright's disease may seem to the clinician, the end result of investigation to date is far from such. Though elaborate methods are often used in the investigative studies, they have not resulted in the clinician's being forced to adopt them. Rather have these studies resulted in simplifying the clinician's task by increasing the significance of simple procedures readily available to all clinicians.

REFERENCES

1 Starling, E. H.: On the absorption of fluids from the connective tissue spaces. J. Physiol. 19:312, 1895-96.

2 Cushny, A. R.: The Secretion of the Urine, Ed. 2, London, Longmans, Green and Co., 1926.

3 Richards, A. N., and Walker, A. M.: Quantitative studies of the glomerular elimination of phenol red and indigo carmine in frogs. J. Biol. Chem. 87:479, 1930.

4 Freeman, B., Livingston, A. E., and Richards, A. N.: A second series of quantitative estimations of the concentration of chlorides in glomerular urine from frogs. J. Biol. Chem. 87:467, 1930.

5 Walker, A. M., and Elsom, K. A.: Quantitative study of glomerular elimination of urea in frogs. J. Biol. Chem. 91:593, 1931.

6 Rehberg, P. B.: Studies on kidney function. I. The rate of filtration and reabsorption in the human kidney. Biochem. J. 20:447, 1926. II. The excretion of urea and chlorine analysed according to a modified filtration-reabsorption theory. Biochem. J. 20:461, 1926.

7 Richards, A. N., and Schmidt, C. F.: A description of the glomerular circulation in the frog's kidney and observations concerning the action of adrenalin and various other substances upon it. Am. J. Physiol. 71:178, 1924-25.

8 Volhard, F., and Fahr, Th.: Die Brightsche Nierenkrankheit, Berlin, J. Springer, 1914.

9 Addis, T.: A clinical classification of Bright's diseases. J. A. M. A. 85:163 (July 18) 1925.

10 Addis, T., and Oliver, J.: The Renal Lesion in Bright's Disease, New York, Paul B. Hoeber, Inc., 1931.

11 Van Slyke, D. D. et al.: Observations on the courses of different types of Bright's disease, and on the resultant changes in renal anatomy. Medicine. 9:257, 1930.

12 Blackfan, K. D., and McKhann, C. F.: Nephritis in childhood. Oxford Medicine. 3:772 (59), Chap. XI—A.

13 Volhard, F.: Die doppelseitigen hämatogenen Nierenerkrankungen, Berlin, J. Springer, 1918.

14 Blackfan, K. D., and Mills, C. A.: The effect of a two per cent magnesium sulphate solution on the cerebral symptoms of acute nephritis. Trans. Am. Ped. Soc. 35:197, 1923.

15 Aldrich, C. A.: Treatment of the acute cerebral complication of "nephritis". Am. J. Dis. Child. 41:1265, 1931.

16 Marshall, E. K., Jr.: The influence of diuresis on the elimination of urea, creatinine and chlorides. J. Pharmacol. & Exper. Therap. 16:141, 1920-21.

17 Carr, A. D.: The effect of water diuresis on the elimination of certain urinary constituents. J. Pharmacol. & Exper. Therap. 18:221, 1921.

18 Gamble, J. L., Blackfan, K. D., and Hamilton, B.: A study of the diuretic action of acid producing salts. J. Clin. Investigation. 1:359, 1924-25.

19 Linder, G. C.: The effect of mineral acid on acid-base regulation in health and in nephritis. Quart. J. Med. 20:285, 1926-27.

20 Peters, J. P., Wakeman, A. M., Eisenman, A. J., and Lee, C.: Total acid-base equilibrium of plasma in health and disease. X. The acidosis of nephritis. J. Clin. Investigation. 6:517, 1928-29.

21 Hartmann, A. F., and Darrow, D. C.: Chemical changes occurring in the body as a result of certain diseases in infants and children. II. Acute hemorrhagic nephritis. Subacute nephritis; severe chronic nephritis. J. Clin. Investigation. 6:127, 1928-29.

22 Atchley, D. W., and Benedict, E. M.: Serum electrolyte studies in normal and pathological conditions: pneumonia, renal edema, cardiac edema, uremic and diabetic acidosis. J. Clin. Investigation. 9:265, 1930-31.

23 Briggs, A. P.: The acidosis of nephritis; its clinical significance. Arch. Int. Med. 49:56, 1932.

24 Holten, C., and Rehberg, P. B.: Studies on the pathological function of the kidneys in renal disease, especially Bright's disease. Act. Med. Scand. 71:479 and 538, 1931.

25 Ellis, A. W. M.: Disturbance of the acid-base equilibrium of the blood to the alkaline side: alkalaemia. Quart. J. Med. 17:405, 1923-24.

26 Hartmann, A. F.: Chemical changes occurring in the body as the result of certain diseases. 1. The effects of diarrhea, vomiting, dehydration and oliguria on the acid-base balance of the plasma of infants with mastoiditis. Am. J. Dis. Child. 35:557, 1928.

27 Sansum, W. D., Blatherwick, N. R., and Smith, F. H.: The use of basic diets in the treatment of nephritis. J. A. M. A. 81:883 (Sept. 15) 1923.

28 Wakefield, E. G., and Keith, N. M.: Severe renal insufficiency; untoward effects of intravenous administration of solution of sodium chloride. Arch. Int. Med. 49:165, 1932.

29 Leiter, L.: Nephrosis. Medicine. 10:135, 1931.

30 Wolbach, S. B., and Blackfan, K. D.: Clinical and pathological studies on so-called tubular nephritis (nephrosis). Am. J. M. Sc. 180:453, 1930.

31 Fahr, T.: In Handbuch der speziellen pathologischen Anatomie und Histologie by F. Henke and O. Lubarsch, Berlin, J. Springer, vol. 6, 1925.

32 Aschoff, L.: Disorders of the kidneys with symptoms of Bright's disease. Guy's Hosp. Rep. 77 (7, series 4): 314, 1927.

33 Löhlein, M.: Zur Pathogenese der Nierenkrankheiten. II. Nephritis und Nephrose, mit besonderer Berücksichtigung der Nephropathia gravidarum. Deutsche. med. Wchnschr. 44:1187, 1918.

34 Löwenthal, K.: Weitere Beiträge zur Frage der Lipoidnephrose. Beitr. z. path. Anat. u. z. allg. Path. 79:497, 1927-28.

35 Fishberg, A. M.: Hypertension and Nephritis, Philadelphia, Lea & Febiger, 1930.

36 Hawkins, J. A., MacKay, E. M., and Van Slyke, D. D.: Glucose excretion in Bright's Disease. J. Clin. Investigation. 8:107, 1929-30.

37 Munk, F.: Über die Behandlung der Nierenbegleiterkrankungen (Nephrosen). Therap. d. Gegenw. 29 (N. F.):54, 1927.

38 Epstein, A. A.: Über Diabetes albuminuricus, die sogenannte chronische Nephrose. Arch. f. Verdauungskr. 41: 31, 1928.

39 Hewitt, L. F.: Identity of urinary albumin. Biochem. J. 21:1109, 1927. Urine proteins in nephrosis, pregnancy, and myelomatosis. Lancet. 1:66, 1929.

40 Hiller, A., McIntosh, J. F., and Van Slyke, D. D.: The excretion of albumin and globulin in nephritis. J. Clin. Investigation. 4:235, 1927.

41 Kerr, W. J., Hurwitz, S. H., and Whipple, G. H.: Regeneration of blood serum protein. II. Influence of diet upon curve of protein regeneration following plasma depletion. Am. J. Physiol. 47:370, 1918-19.

42 Epstein, A. A.: Concerning the causation of edema in chronic parenchymatous nephritis: method for its alleviation. Am. J. M. Sc. 154:638, 1917. Further observations on the nature and treatment of chronic nephrosis. Am. J. M. Sc. 163:167, 1922.

43 Peters, J. P., and Van Slyke, D. D.: Quantitative Clinical Chemistry Interpretations, Baltimore, The Williams & Wilkins Co., 1931, p. 687.

44 Davidson, J. R.: A case of adolescent myxoedema, accompanied by nephrosis and by tetany of parathyroid origin, treated with thyroid and Collip's parathyroid extract. Canad. M. A. J. 15:803, 1925.

45 Eppinger, H.: Zur Pathologie und Therapie des menschlichen Ödems, Berlin, J. Springer, 1917.

46 Epstein, A. A.: Thyroid therapy and thyroid tolerance in chronic nephrosis. J. A. M. A. 87:913 (Sept. 18) 1926.

47 Davidson, J. R.: Nephrosis of thyroid origin. Canad. M. A. J. 18:161, 1928.

48 Lewis, D. S., and Scriver, W. de M.: The response of chronic nephrosis to parathyroid and thyroid medication. Ann. Int. Med. 2:66, 1928-29.

49 McCann, W. S.: Parathyroid therapy. J. A. M. A. 88:566 (Feb. 19) 1927.

THE TUBERCULOSIS RECORD FOR 1931

By Frederick L. Hoffman, LL.D.
Consulting Statistician

Excerpts From *The Spectator*, September 15, 1932

The pulmonary tuberculosis death rate during 1931 reached the lowest figure on record, or for fifty-nine American cities a rate of 63.2 per 100,000 against a rate of 174.4 in 1910. In the history of human diseases there is nothing to compare with this comparatively rapid decline in what, at one time, was the leading cause of death, and it is altogether fitting that the fiftieth anniversary of the discovery of the essential cause of tuberculosis by Dr. Robert Koch should be made the occasion of memorials commemorating one of the greatest events in preventive medicine. It has been said by Pfeiffer that "The intervening 50 years have added scarcely anything material to Koch's work."

It must not be overlooked that there are fundamental reasons for the reduction in the pulmonary tuberculosis mortality such as curtailed working hours of wage earners; immense improvements in shop or working conditions yielding better air and ventilation, more sunshine, and particularly less industrial dust.

Statistics show an actual reduction in deaths from tuberculosis from 26,494 in 1930 to 25,498 in

(Continued on Page 80)

VERMONT STATE MEDICAL SOCIETY

PNEUMOTHORAX TREATMENT IN TUBERCULOSIS*

BY EDWARD J. ROGERS, M.D.†

JUST nineteen years ago Dr. Lawrason Brown of Saranac came to Burlington to address us on this same subject. They had been doing pneumothorax treatment in Saranac for one or two years only and when Dr. Brown spoke he used notes instead of reading a paper. Later on Dr. Hamilton tried to get him to write a paper for the *Vermont Medical Journal* but Dr. Brown felt that he had spoken too enthusiastically about the possibilities of pneumothorax treatment and said that he would rather wait a year or so before writing his conclusions. Shortly after Dr. Brown spoke in Burlington, we began pneumothorax treatment at the Vermont Sanatorium. Dr. Edward M. Packard of Saranac Lake came over and started the collapse treatment in four cases. One of these cases, a far advanced case from Ludlow, Vermont, is still living and has since had two healthy children. At that time we had no x-ray equipment at Pittsford, and later on when we did put in one of the cheaper machines the service was unsatisfactory and we did not get films that could be compared with those of today. From time to time we collapsed an occasional case, but we were greatly handicapped by the one year rule at the Vermont Sanatorium. Patients were then allowed to stay at the Sanatorium only twelve months, and transportation was more or less difficult and we hesitated to start the treatment and turn the patients out of the Sanatorium at the expiration of a year. For a number of years we discontinued the use of pneumothorax almost entirely, doing only an occasional visitor or continuing some case referred back to the Sanatorium from some other institution or resort. Four or five years ago pneumothorax therapy was given a tremendous impetus by the more general knowledge and use of other surgical procedures, such as phrenicectomy, pneumolysis, thoracoplasty and oleothorax. At every tuberculosis meeting more and more papers were read on surgical subjects and various institutions were reporting that fifty per cent of their cases were on some type of collapse treatment. About this time we put in a modern x-ray plant with a vertical fluoroscope. A little later we developed an interest in stereoscopic films and a year later we had a considerable number of cases under pneumothorax treatment. In June, 1932, out of a total population of 62 patients we had approximately 28 under pneumothorax treatment, seven had undergone phrenicectomies during the fiscal year, one had undergone thoracoplasty, and since July we have had our first pneumolysis case.

As the work increased our interest likewise increased and the favorable results became more and more apparent. The Department of Public Welfare abrogated the one year rule at Pittsford several years ago and we are now able to keep our cases indefinitely if they need institutional treatment. Dr. Avery is treating a large number of cases at the Washington County Hospital and also has a group of patients in the city of Barre. Several other physicians have bought pneumothorax equipment and quite recently I have been able to interest one of the Burlington doctors in pneumothorax treatment for patients who have left a sanatorium and who wish to continue treatment at home. At Pittsford we refill a large number of cases every Tuesday and we have two or more refills practically every day in the week. I have repeatedly invited individual physicians throughout the state to visit our clinic and have offered to get up a class any day that any physician wishes to visit us. Dr. John B. Hawes of Boston published a very valuable paper in the *Journal of the American Medical Association*, June 11, 1932. He called attention to the fact that we were not doing so much surgery in New England as is being done in some of the western institutions. I think the William Wirt Winchester Hospital, West Haven, Conn., was a notable exception. He did not mention the tremendous amount of surgical work being done in the four Connecticut State institutions. My paper today is more or less a repetition of the ideas expressed by Dr. Hawes. We need more active surgical treatment in tuberculosis in New England. Collapse treatment is indicated in nearly every case of well-defined unilateral pulmonary tuberculosis.

Many cases of bilateral tuberculosis should be collapsed, especially if one side is much worse than the other.

All cavity cases should be collapsed if possible.

Hemorrhage is an indication if one is reasonably certain that the blood comes from that particular side.

Recently we have had several cases of pleurisy with effusion in which the evidence of pulmonary tuberculosis was so strong that we drew off the fluid and filled the chest with air.

*President's address delivered at the Annual Meeting of the Vermont State Medical Society, October 6, 1932.

†Rogers—Superintendent and Medical Director, Vermont Sanatorium, Pittsford since 1913. For record and address of author see "This Week's Issue," page 99.

CONTRAINDICATIONS

Patients who have heavy shadows more or less like the shadows of lobar pneumonia often do badly on collapse therapy.

Most observers hesitate to use pneumothorax treatment for bronchiectasis and lower lobe abscess.

(While Dr. Rogers was reading his paper Dr. A. D. Poverman and Mr. Alfred Frechette, junior student, each made a refill in plain view of the audience.)

We roughly group our patients as follows:

(1) Cases easily collapsed,
(2) Difficult cases or failures,
(3) Cases in which fluid develops,
(4) Cases showing marked adhesions,
(5) Cases showing suspended cavities.

Fluid is the most common complication. In over one-half of the cases a small amount of fluid, presumably about one to five ounces, forms and is usually absorbed, but in many cases the fluid is much larger in amount and often the pleural space is half filled with it. Ordinarily we draw this fluid off and put in more air. In other cases we let the fluid alone and it is gradually absorbed. When the fluid begins to get thick and gray and shows a large number of neutrophiles we draw it off and replace it with a pure olive oil containing five per cent or two and one-half per cent of Gomenol. In those cases showing suspended cavities with long string-like or band adhesions we resort to the operation known as pneumolysis. A modified cystoscope known as a thoracoscope is inserted through a cannula placed either in the front or the back of the chest and a cautery is introduced through another cannula placed either in the back or the front of the chest and the adhesions are slowly burned. We are not yet equipped for burning these adhesions at Pittsford but later on we hope to have our staff do this highly specialized procedure. We have recently sent a case to Dr. Edward S. Welles of Saranac Lake. Dr. Edward D. Churchill of Boston, who is to speak later, has also been in Stockholm to observe the work of Dr. Jacobaeus and he has done a large number of operations in and near Boston.

If we are unable to collapse the lung by pneumothorax treatment we often resort to the "nerve" operations known as phrenicectomy and phrenicotomy. Phrenicectomy means either cutting out about two and one-half inches of the phrenic nerve or cutting it and then pulling out all of the lower end of the nerve. Phrenicotomy means the crushing or cutting of the phrenic nerve. If the nerve is cut or crushed it usually resumes its function in about six months' time. If we cut or crush the nerve or take out a section two and one-half inches long or pull out the entire nerve we get the following results:

1. Diaphragm on that side is paralyzed.
2. Diaphragm gets longer.
3. Diaphragm rises upward thereby decreasing the size of the pleural space.

If all of the above procedures are unsatisfactory our last resort is thoracoplasty, or what is also known as the "rib" operation. The films which I am now showing belong to one of our patients who was operated on in April, 1932, by Dr. Churchill.

Beginning in the back he took out the greater part of the first rib, about three inches from the second rib and a little more from each rib down to and including the eleventh rib. The front halves of these ribs are left intact but they fold inward and backward, obliterating the entire pleural cavity on that side.

SUMMARY

1. We believe that a large number of fibroulcerative unilateral cases are definitely improved and often cured by pneumothorax treatment.
2. The initial attempts to collapse a lung should be made in a sanatorium or a hospital after serial x-ray films have been taken.
3. During the first few weeks of treatment frequent x-ray films and fluoroscopic observations should be made before and after each treatment.
4. Many cases of bilateral tuberculosis derive definite benefit from pneumothorax treatment.
5. A large number of cases unsuccessfully treated by pneumothorax are tremendously helped by phrenicotomy or phrenicectomy.
6. A limited number of cases showing suspended cavities are greatly benefited by burning the adhesions.
7. If all of the above procedures have failed to bring about desired results, cavities are ultimately closed by thoracoplasty or the "rib" operation.
8. We advise the use of olive oil and Gomenol in all cases in which the fluid shows neutrophiles.

MISCELLANY

VERMONT DEPARTMENT OF PUBLIC HEALTH

Vital statistics for the ten months of the year are now practically complete and it is possible to estimate the number of deaths which will probably be shown in 1932. Deaths from communicable diseases and cancer as compared with two previous years are indicated in the following tables:

	1930 12 Mos.	1931 12 Mos.	1932 10 Mos.	Estimate 12 Mos.
Chicken pox	1	0	0	0
Diphtheria	7	4	3	4
Measles	3	7	30	35
Mumps	0	0	0	0
Poliomyelitis	3	11	1	2
Scarlet fever	11	5	8	9
Smallpox	1	1	4	4
Typhoid fever	3	6	1	2
Whooping cough	11	23	7	8
Pulmonary Tuberculosis	208	214	142	170
Cancer	457	444	397	475

During the month the incidence of communicable disease was as follows: chicken pox 183, diphtheria 9, measles 5, mumps 106, poliomyelitis 2, scarlet fever 38, whooping cough 22 and tuberculosis 6.

There were reported 35 new cases of gonorrhea and 25 new cases of syphilis. Four hundred and sixty-eight Wassermann outfits and 134 slides were distributed during November.

The Laboratory of Hygiene made a total of 1,479 examinations classified in the following manner:

Examinations

For Diphtheria Bacilli	169
For Widal Reaction of typhoid fever	29
For Malarial Parasites	0
For Tubercle Bacilli	143
For Evidence of Syphilis	435
For Gonococci in Pus	146
Of Water, Chemical and Bacteriological	67
Of Water, Bacteriological	217
Of Milk, Market	186
Of Milk, submitted for chemical only	4
Of Milk, submitted for microscopical only	1
Of Foods	1
Of Drugs	0
For the Courts, autopsies	0
For the Courts, Miscellaneous	13
Miscellaneous	66
Autopsies to complete Death Returns	2

The State Advisory Nurses visited several towns assisting in the organization of Well Baby Consultation Conferences, in toxin-antitoxin clinics, speaking to Parent-Teachers Associations and giving talks to other organizations.

The Polio After-Care Nurses visited 100 patients in their homes and four patients were seen at the office. One hundred and thirteen home visits were made, 1 plaster cast removed, 22 new pieces of apparatus fitted, 44 orthopedic corrections made to shoes, nine pieces of apparatus altered or repaired and one patient admitted to the Massachusetts General Hospital. Sales during the month reported by the vocational worker of this division amounted to $78.70.

APPOINTMENT OF DR. LEON E. SAMPLE

Dr. Leon E. Sample of St. Albans, Vermont, physician, surgeon and member of the American College of Surgeons, has been appointed chief surgeon of the Central Vermont Railway, with headquarters at St. Albans.

THE TUBERCULOSIS RECORD FOR 1931

(Continued from Page 77)

1931, or a reduction in the death rate from 63.3 per 100,000 to 59.8.

The death rate increased in 67 cities, decreased in 114, and remained the same in one. Cities with apparently excessive death rates from pulmonary tuberculosis have been as follows, selecting only such cities as had rates in excess of 100 per 100,000:

Cities with Excessive Pulmonary Tuberculosis Death Rates in 1931

(Rate per 100,000)

Trenton, N. J.	100.9
Concord, N. H.	101.6
Lexington, Ky.	103.8
Washington, D. C.	106.0
Memphis, Tenn.	106.4
Savannah, Ga.	112.6
Macon, Ga.	113.1
Jacksonville, Fla.	116.3
Honolulu, Hawaii	123.0
Charleston, S. C.	125.1
San Antonio, Texas	125.8
New Orleans, La.	136.5
Augusta, Ga.	151.7
El Paso, Texas	228.6

Cities with Low Pulmonary Tuberculosis Death Rates in 1931

(Rate per 100,000)

Lansing, Mich.	7.4
Gloucester, Mass.	8.2
Union City, N. J.	9.5
Kenosha, Wis.	11.7
Lynn, Mass.	11.7
Pontiac, Mich.	11.7
Lakewood, Ohio	12.2
Elmira, N. Y.	12.6
Newton, Mass.	13.3
Lawrence, Mass.	13.9
Pawtucket, R. I.	15.2
Medford, Mass.	16.1
Salem, Mass.	16.1
New Haven, Conn.	16.6
Grand Rapids, Mich.	18.0
Rockford, Ill.	18.1
Massillon, Ohio	18.2
Topeka, Kans.	18.2
Highland Park, Mich.	18.6
Cicero, Ill.	18.8
Minneapolis, Minn.	18.8
Spokane, Wash.	18.8
Somerville, Mass.	19.0
New Rochelle, N. Y.	19.6
Berkeley, Calif.	19.9

HEALTH EDUCATION IN THE CITY OF BOSTON

BY RUTH I. PARSONS, C.P.H.,* AND C. E. TURNER, DR.P.H.*

(Continued from Page 27, issue of January 5)

III. HEALTH EDUCATION IN THE BOSTON PUBLIC SCHOOLS

The public schools of the City of Boston serve approximately 135,000 pupils. There are 101,158 pupils in the Elementary and Intermediate (Junior High) Schools, and 29,089 in High Schools. We shall consider here only regular day schools and Continuation Schools.

The City is divided geographically into 82 Intermediate and Elementary School Districts, each under the supervision of a Master. The system is at present in the process of being converted from the 8-4 to the 6-3-3 plan of organization. As a result, there are now 27 districts with Grades I to VIII inclusive, and 30 districts with Grades I to VI; 10 districts with Grades I to IX inclusive; and 15 districts with Grades VII to IX (Intermediate or Junior High Schools) inclusive. In order to care for pupils entering from both of these systems, Senior High Schools give both three- and four-year courses. There are seventeen Senior High Schools, a Continuation School, and two Trade Schools. In addition, the City maintains the Teachers' College of the City of Boston and the Boston Clerical School. There are also three special school districts: The Horace Mann School (for deaf children), The Walter Fernald School (for mentally retarded children) and the Disciplinary Day School (for problem children).

Health instruction and training in the Boston Public Schools is under the supervision of the Supervisor of Health Education. Source and reference materials for teachers and pupils are submitted for approval to the Board of Superintendents, by a committee made up of masters, teachers, directors and a member of the Board of Superintendents. The purchasing of all textbooks from this approved list is in the hands of Masters of Districts.

Demonstrations of several teaching films in the fields of physiology, hygiene and sanitation have been given before groups of school children, parents, teachers and masters. As a result of this the school department has made available for teaching purposes a group of films which is constantly being enlarged.

An excellent start has been made in the accumulation of reference material for teacher use. The chief source of such reference books is found at the Administration Library, one section of which is devoted to Health. Some Masters have also arranged small but useful libraries of books on health subjects in their individual schools.

A very important service is rendered to the teaching of health by various extra-school health agencies. The New England Dairy and Food Council supplies a great quantity of valuable supplementary material for the use of classroom teachers. Other agencies supplying material and assistance include the Boston Tuberculosis Association, the Massachusetts Tuberculosis League, the Food Clinic of the Boston Dispensary, the Nutrition Clinic at Forsyth Dental Infirmary, the State Department of Health, the Boston City Health Department, and the Massachusetts Safety League.

A. Elementary and Intermediate Schools

1. *Coöperative Activities*

Before considering direct health education activities, we shall discuss certain allied activities which have a relationship to the health education program and toward the success of which the direct health education activities make certain contributions. These coöperative activities may be classified as (a) the Correction of Physical Defects, (b) the Prevention and Control of Communicable Diseases, (c) the Interpretation of the School Health Program to the Home and Coöperation with the Home in Health Training, (d) Physical Education, and (e) the Maintenance of Hygienic Classroom Conditions.

a. *Correction of Physical Defects.* The Corrective program is properly most intensive in the Elementary Schools, although it extends through the secondary grades. Each year, every child in the Boston Public Schools receives an examination by a school physician, assisted by a school nurse. Parents are invited to be present. Existing physical defects are reported to the home, and are recorded on the child's health card which is filed in the teacher's desk and follows the child throughout his school life. Corrections are secured through the work of nurses and teachers. The nurse visits the homes of children, explains defects to parents, and may, if necessary, make appointments and take the children to clinics. Classroom teachers, too, are interested in having all their pupils in good physical condition; they urge pupils to have defects corrected, and many make contacts with homes. In one school, classrooms were found to have had a campaign to secure the correction of all remediable defects. The extension of such activities is urged by the Supervisor of Health Education.

In every school district, a widespread campaign for the correction of dental defects is in progress. Children are urged to have their family dentist sign certificates stating that all necessary dental work has been completed. Chil-

*Parsons and Turner—For records and addresses of authors see "This Week's Issue," page 99.

dren who cannot secure the services of private dentists are taken by the school nurse to the City Health Unit or to other clinics. As soon as all pupils in a classroom have all dental defects corrected, the room is awarded a certificate. Individual teachers have used special motivating devices to accelerate correction.

Common and minor postural defects are corrected under the direction of the Department of Physical Education. More serious orthopedic defects are referred to physicians. In the elementary schools the corrective exercises are given by the classroom teacher under the direction of a Supervisor of Physical Education. In the Intermediate Schools corrective exercises are given by physical education teachers. The success of this program is evident in the excellent postural appearance of children as they sit in classrooms or file between classes.

b. *Prevention and Control of Communicable Disease.*

Due to a splendidly organized preventive program the problem of communicable disease control among school children has been reduced to a minimum. Children are vaccinated against smallpox before school entrance. The diphtheria immunization campaign is concentrated in the kindergarten and Grades I and II. Approximately 10,000 children are immunized each year, and about 75% of the total school population is reached.

Each morning, every school receives a copy of the City Health Department List of Cases of Communicable Disease reported the preceding day. These are arranged alphabetically by wards. Names and addresses of patients are included. Upon the recommendation of doctor and nurse, other members of the patient's family are excluded from the schools and quarantine, isolation, and immunization rules are enforced. Children in classrooms where a case of communicable disease appears are inspected each morning until all possibility of contagion has passed.

A check-up on skin, hair and throat conditions is made by the nurse at the time of regular classroom inspections which are made as follows:

Kindergarten, Grades I, II, III—Every month.

Grades IV, V, VI—Every other month.

Grades VII, VIII, IX—Every three months.

As a part of the daily health inspection program, teachers refer to doctor or to nurse any pupils who show deviations from normal. They keep a monthly record of absences and illnesses.

c. *Interpretation of the School Health Program to the Home, and Coöperation with the Home in Health Training.*

The interpretation of the health program to the home is accomplished by the nursing service, and by classroom teachers. The contact of the nurse with the home is the more extensive. Classroom teachers encourage children to take home health notebooks, pamphlets and other materials. They receive visits from mothers and offer helpful suggestions. Over a period of years, a splendid feeling of sympathy and understanding has been developed between the school personnel and the families of their pupils. Parents are, in most cases, eager to carry out suggestions made by teachers or nurses. It is a tribute to the high character and morale of these groups that this trust and confidence has been placed in their judgment.

In sections where children receive health training at home, teachers recognize the basic importance of this training and build a coöperating rather than a competing program. In areas where there is little health training in the home, the work of the teachers is particularly valuable.

d. *Coöperation with the Physical Education Program.*

The chief coöperative health activity carried on by the Physical Education Service is for the Correction of Postural Defects. Talks on recreation and related health habits are often given to gymnasium classes in Junior High and Senior High Schools.

Classroom teachers can and do to some extent stimulate the interest of children in the physical activity program while teachers of physical education contribute materially toward the development of a right attitude toward health on the part of the pupils.

e. *Maintenance of Hygienic School Conditions.*

The detailed control of conditions of ventilation, lighting, seating and cleanliness are in charge of the custodian service which is of excellent calibre throughout the school system. Teachers record classroom temperatures, decide upon needed changes in seating and develop in their pupils a feeling of pride in the condition of their surroundings. The promotion of a healthful, happy environment, and the maintenance of reasonable discipline are also valuable training for the mental health of the child.

Direct supervision of school sanitation is in the hands of a Sanitary Inspector.

2. *Routine Procedures*

There are certain routine procedures commonly found in the public schools which are distinct from regular classroom instruction but of sufficient importance to receive special consideration in a survey of this type. These include, (a) Weighing and Measuring, (b) Morning Inspection, (c) School Lunches, and (d) Relaxation Periods.

a. *Weighing and measuring,* except for chil-

dren in Rest-Nutrition Classes, is done twice yearly at the time of the annual physical examination. A few schools are making use of the educational value of weighing and measuring children.

b. *Morning inspection* of classes for cleanliness, for the practice of some particular health habit, or for signs of communicable disease is very generally carried on throughout the Elementary Schools of Boston. In all kindergartens and primary grades, particular attention is paid to cleanliness of hands. In many schools, banners for Cleanliness and for Posture are awarded each week at the assembly period to the class showing the best record. In some schools ranking of this project is in charge of the pupils themselves. Special emphasis is also placed upon cleanliness of clothing. Among the boys, Necktie Clubs prove very popular. By continuously drilling on habits which make for good health, teachers are able gradually to build up right attitudes and to set high standards for their performance.

c. *School lunches* are of two types, mid-morning lunches and noon lunches. In some schools, particularly in the lower grades, a milk lunch, with or without crackers, is sold to children at ten o'clock each morning. Its distribution is in most cases in charge of a matron, who sees that cleanliness in equipment is observed. In kindergartens, the milk luncheon is made a social affair where table etiquette, as well as food habits, is taught. A discussion of lunches served to undernourished children is given on a following page.

In all of the two-session regular schools, children return to their homes for the noon meal. In one-session schools, lunchroom facilities are available for this meal.

In most cases, the lunchroom is under the direction of the Women's Educational and Industrial Union, which provides food at cost. In the schools where the service is not available through this organization, the lunchroom concession is in the hands of private individuals. Candy is either not served, or available only after the regular meal. Little is done at present to make the noon lunch educational from a health point of view; although some steps have been taken in this direction.

d. *Relaxation periods* are regularly observed in all kindergartens and first grades. The children rest for fifteen or twenty minutes near the middle of the school session. If rugs are available, the pupils rest on the floor in an outstretched position. Otherwise they place heads on their desks. (Rest periods for classes of undernourished children will be discussed later.) Relaxation from regular classroom activities is also provided by the mid-morning setting-up exercises in grades through the sixth, and by the gymnasium classes in the Intermediate Schools.

3. *Direct Classroom Instruction in Health*

a. *Grades I-VI.*

In the Elementary Schools (Kindergarten, Grades I-VI) each classroom teacher is responsible for the health teaching in her own room. In one of the school districts visited, all health teaching for Grades III-VI inclusive is in the hands of a health teacher. In addition, the nurse assigned to the district gives occasional classroom talks on health subjects. The needs of the children in a particular neighborhood determine to a considerable degree the sequence and emphasis of health instruction given.

One section of the regular Course of Study for each grade is devoted to *Hygiene.* Although these outlines were organized some years ago, some of the points and suggestions made are valid and helpful. Other elements of the outline could be distinctly improved by modification in the light of more recent experience. No new approach is suggested at each new grade level.

The Course of Study for each grade was prepared by a separate committee composed of classroom teachers in that grade, under the direction of an Assistant Superintendent of Schools. The complete Course of Study for the Elementary Schools was not made at one time, nor was it coördinated and related through the work of a central committee responsible for the construction of a health education curriculum for the whole school system. The Course of Study for Grades I to VI inclusive was prepared and put into use before the Supervisor of Health Education for the Boston Schools was appointed.

In addition to the material contained in these Courses of Study, the first unit of the course in Character Education is devoted to Health. It is required that each teacher in Grades I-XII spend fifteen minutes per day on character training, and that additional teaching be done in correlation with other subjects of the curriculum. Excellent supplementary materials for Character and Health Education are supplied through the coöperation of the Women's Municipal League.

In Grades I and II, no time is set aside for health teaching. The syllabus suggests that the "course of study in hygiene be covered within the time allotted to opening exercises and oral composition". In Grades III to VI inclusive, 30 minutes per week is specified for instruction in health.

No one series of textbooks is in general use in any school district or at any particular grade level. The pupils in one or more classes of each of the elementary schools visited are regularly using standard textbooks as a basis for health training and instruction. In the majority of elementary classes visited, however, there were no textbooks except the single copy of one or more books in the hands of the teacher.

In some schools, the policy of rotating sets of textbooks among classes of the same grade was in operation.

In fifth and sixth grades where sets of health textbooks are available for class use, it is commonly the practice to utilize the thirty minutes allotted weekly for health as a recitation period. The children may be given a portion of the time to study material from the text, after which they answer questions on the subject covered. Such teaching lessons are often supplemented by the use of charts, models and diagrams.

The recitation period, as such, is less common in the lower grades where health instruction is, for the most part, given in correlation with other subjects of the curriculum. Informal health teaching is commonly done in connection with other subjects. Examples of these are listed below:

Art: In practically every grade, correlation with art is noted. In this field, posters illustrating health rules and drawings of fruit and vegetables are very popular.

Arithmetic: Children in the lower grades count such objects as apples, bananas, and oranges.

English: In the upper grades, children often write original stories and poems having health value.

Music: Many classes sing songs to which toothbrush drills and other health activities are done in pantomime.

Reading: Some teachers are active in securing supplementary health reading books from outside sources for use with their classes.

Special attention is being given to the teaching of safety in the Boston Public Schools. The Massachusetts Safety Council and the Children's Safety League are coöperating in these plans. This instruction in safety is being naturally and satisfactorily related to the health education program.

Health is thus taught directly and in correlation with other subjects. The integration of instruction is secured in this way rather than through the assignment of class time for the study of life situations where an attempt is made to contribute to all subjects without reference to subject-matter boundaries.

Special devices and activities are used by individual teachers and by schools for interesting children in health. In nearly every district, several assembly periods during the year are devoted to health. Outside speakers from such organizations as the New England Dairy and Food Council are frequently present. Moving pictures and lantern slides are used. Health plays developed by different classes are also presented at health assemblies.

In many schools, all of the health work for the year is summarized in the Child Health Day celebration held early in May. At this time, special programs and exhibits are arranged in individual classrooms and the entire school joins in presenting an exhibition of its health work (often in the form of an outdoor demonstration) to which parents and friends are invited. This is an important means of securing parent interest and coöperation in the health program.

b. *Intermediate Schools.*

Health is taught to all pupils in Grades VII, VIII and IX for one forty-minute period per week throughout the school year. Two types of general organization for health teaching exist in the Intermediate Schools: (1) health teaching by all home-room teachers; (2) health teaching by one teacher. There is a tendency toward the concentration of health teaching. In a few schools, classes are still being taught by home-room teachers, however. It is obvious that the ideal type of organization depends upon the specific situation in a school. In any case, health teaching at this grade level should be in the hands of teachers specially trained in this field.

When the Supervisor of Health Education was appointed in 1929, there was a course of study for the first six grades as indicated above, but there were no teaching outlines whatever for Grades VII, VIII and IX. It seemed to the Supervisor that some organized plan should be established in these grades at the earliest possible moment and a tentative syllabus was at once prepared under the title of—"A Working Outline in Health Education." This is essentially a topical outline—not a detailed course of study. It does not aim to present subject-matter for teacher or pupils. Suggestions for classroom teaching methods are very brief. It contains no textbook or other references and no lists of supplementary or source materials.

It should be borne in mind that this is a first step in the organization of instruction. The outline is to be used by teachers in developing more detailed procedures which in turn might be used in building a more detailed Course of Study. Such a course of study for these three grades is now in process of preparation by a committee under the chairmanship of a Junior High School Principal, with the guidance of the Supervisor of Health Education. This committee is composed of health teachers and teachers of related subjects. This new course of study is not yet available for examination, but will be issued shortly.

The tentative outline first placed in the hands of teachers suggests that in Grade VII such topics as Health in Home, at School, and in the Neighborhood, First Aid, Alcohol, Tobacco and Patent Medicines, a Time Budget, and Vacation Time, be covered. For Grade VIII, the topics relate to Foods, General Physiology and Hygiene. In Grade IX, the material relates to Civic Health, and its objectives are stated as "To develop an understanding and appreciation of public health service among the children by application of health education to citizenship; to

acquaint the children with the public and private agencies in their community which have been organized for their welfare."

As would be expected in this developmental stage, the health knowledge which is being presented in different Intermediate School Courses in Hygiene is somewhat varied. Each instructor develops in most detail those phases of the subject which he considers most important. As a result there is an overlapping of subject-matter which should disappear when the detailed course of study is put into operation. In the past, teachers have generally failed to realize that health is a specific subject requiring specific teaching knowledge and specific teaching methods. The teaching of health has in general been less efficient and effective than the teaching of other subjects. Boston is changing this undesirable situation by the centralization of instruction and by the improvement of the training of teachers of health education. The instruction where health teaching has been centralized under specially trained teachers is excellent. Instruction where work has not been so organized is in general less satisfactory.

Nearly all classes have access to sets of standard health textbooks for reference in their study of units of work. Excellent collections of supplementary material such as charts, models and source books are available.

In many but not all schools, Grades VII and VIII show correlation between Hygiene and General Science. Both subjects are required of all pupils in these grades. This correlation affords an excellent opportunity for linking the study of such topics as *Bacteria* and *Home Sanitation*, *Textiles* and *Healthful Clothing*, *Ventilation* and *Why the Body Needs Fresh Air*. Such correlation is to the mutual advantage of both courses. With the coöperation of a professor at Teachers' College, boxes of supplementary visual and experimental material for use in teaching science are supplied to the Intermediate Schools. The units on Ventilation, on Light and Sound and on Food are especially valuable also for hygiene teaching and their use is being recommended in the new Course of Study. A course in *General Science* is elective for ninth-grade students in the Technical, General, Commercial, and Mechanic and Practical Arts Curricula. Some incidental health teaching is done in connection with this course, but the correlation here is at present less specific than in Grades VII and VII.

Some material on foods and diet is taught in connection with Household Arts, required of girls in the Practical Arts Curriculum in Grades VII, VIII, and IX, and elective for girls in the General Course in Grade IX.

Community Civics is offered, only as an elective subject, to students in Grade IX who are pursuing the Commercial Curriculum. The *Tentative Course of Study in Civics for Grade IX* suggests two specific objectives for including items relating to the health of the community: "to give an appreciation of the measures taken by the community to protect the health of its citizens," and "to stimulate interest on the pupils' part in maintaining the health of the community". Here the subject is approached entirely from a governmental point of view. It avoids overlapping of subject-matter, yet makes a valuable contribution to the health knowledge and attitudes of the future citizen.

Physical Education, which is required of all pupils in Grades VII, VIII, and IX, makes a distinct contribution to Health Education through its practical demonstration of the value of recreation, play, and good posture, and through occasional talks on subjects relating to personal hygiene. Extra-class activities for the teaching of health are found in assembly periods and clubs.

B. Senior High Schools

The health program in Senior High Schools, as in most cities, is less extensive than that in the Elementary and Intermediate Schools.

Although nursing service is not extended to Senior High Schools, medical service is supplied to these schools, and an appreciable number of physical defects are corrected through the influence of principals, teachers and matrons. First aid and emergencies (in the absence of the physician) are cared for by matrons in the girls' schools, and in the boys' schools by some interested teacher.

Communicable disease control is in the hands of the school physician who, assisted by the principal, checks daily the absentees and pupils in contact with cases listed by the City Health Department.

Training in physical education (required of all girls for two 45-minute periods per week) and military drill (required of boys for two 45-minute periods per week) stimulate the desire for good posture. In some cases, special corrective exercises are advised.

As in Intermediate Schools, little effort is as yet made to use the lunchroom for educational purposes.

Freshmen in four-year high school courses, and other students who have not fulfilled the Hygiene requirement necessary for graduation* take a course in Hygiene one period per week for a year. Such a course is arranged on a basis similar to that given to ninth-grade students in Intermediate Schools. The instructor is usually a member of the science department. Subject-matter varies widely. No assignments are given and textbooks are not extensively used. Beginning in the fall of 1932, home assignments will be given in Hygiene Courses in Grade IX.

*This requirement states that one high school diploma credit in Hygiene must be earned by every pupil in grades above the eighth. In districts where intermediate organization exists, this point is obtained by ninth-grade students.

Instruction in *Home Nursing* is offered in only one public school in Boston, the High School of Practical Arts. Here senior girls who are pursuing the Arts, Dressmaking, and Domestic Science Courses are required to take this course four periods per week throughout their Senior year. The instructor is a nurse with college training. Subject-matter is based on the American Red Cross Textbook, *Home Hygiene and Care of the Sick,* and girls who satisfactorily complete the course are awarded certificates by this organization.

No provision is made for the correlation of health with other subjects of the curriculum. Health is taught to some extent through clubs and occasional assemblies.

C. Special Health Classes

Five types of special classes for help in the correction of defects and the conservation of health among defectives exist in the Boston Public Schools, (1) Rest-Nutrition, (2) Sight-Conservation, (3) Classes for the Mentally Retarded, (4) for Speech Improvement, and (5) for Children with Defective Hearing. Each of these is in charge of a supervisor and taught by persons with special training in their particular field. Instruction (6) for crippled children who are unable to attend school is also provided by the School Department. These special classes are mentioned here because they carry special health education programs adapted to the health needs of special groups of children.

1. *Rest-Nutrition Classes* (25 in number)

Early in the school year, the medical supervisor of nutrition classes, accompanied by the school nurse, inspects groups of children in all classrooms in districts where rest-nutrition classes are in operation. Children who have been retained in the class from the previous year; known tuberculosis contacts and latent cases of this disease; organic cardiacs who in the opinion of the physician will benefit from additional rest in school; habit cases and nervous children referred by physicians, nurses, teachers or clinics; children recently returned from a serious illness and all those notably under par physically are given a careful examination by the medical supervisor assisted by the nurse. The determination of a child's nutritional status and his entrance into the rest-nutrition class is based upon the physical examination (with special attention to muscle tone, subcutaneous fat and posture) and upon the child's personal history (including rate of gain over the past year, personal health habits, and susceptibility to fatigue).

All children who enter these classes are kept under the close supervision of the medical supervisor who physically examines them not only before entrance to the class and at the end of the school year, but also at more frequent intervals if their progress is not satisfactory. She also holds mothers' meetings and individual conferences on their children's health habits. Each month the school nurse weighs the children and checks on their general condition and health habits. Weights are recorded on a chart usually posted in the children's dining room. Children are proud of their records and can tell what habits they have practiced in order to help them to gain. Individual health record cards are kept by the physician and nurse and filed in the dining room.

During rest and lunch periods, the children are in charge of a matron who also buys and prepares their food. Diet lists are issued each week by the supervising physician. When, in the physician's opinion, the child's physical condition warrants his discharge from the rest-nutrition class, he is kept under the nurse's supervision and weighed regularly for several months.

An important administrative advantage in the conduct of these classes is that children in all grades may be cared for in a single group. It will be noted in the accompanying sample schedule that children attend their regular grades for more than half of the school day, therefore admission to or discharge from a rest-nutrition class does not interfere with the regular school curriculum.

A sample daily schedule followed by childen in the Rest-Nutrition Classes is as follows:

9:00-10:00	in regular classrooms.
10:00-10:30	rest on army cots in well-aired room. (Children remove their shoes and are covered with blankets.) handwashing. Soap and paper towels provided; hot water in some cases.
10:30-10:40	lunch, consisting of cocoa or milk and a sandwich or crackers. In warm weather, milk is used and fruit is added.
10:40-10:50	outdoors.
10:50-11:45	in regular classrooms.
11:45-12:45	rest on couches.
12:45- 1:05	dinner. This consists of milk or cocoa, potato or potato substitute, meat (or other source of protein) two vegetables and a dessert. (Fruit is usually included as a dessert or a salad.)
1:05- 1:15	outdoors.
1:15- 3:30	in regular classrooms.

2. *Sight-Conservation Classes* (15 in number)

The purpose of these classes is first, to conserve what vision the children have, and secondly, to give these pupils the education of the normally sighted child without undue eyestrain. The eyes of every school child in Boston are tested each year. Those pupils whose average vision is 20/70 or as low as 20/200 are eligible for sight-saving classes. However, a child with

20/50 normal vision may be admitted if he is suffering from a progressive eye disease. All of these children are under the supervision of an oculist. Sight-saving classes are held in rooms with a north and east exposure where light is least intense. Special equipment includes movable furniture, desks with adjustable tops, textbooks with large type, pencils with large lead, and unglazed paper. Children in these classes are taught special health facts and habits which pertain to their defects; for instance: "Do not read in glaring light," "Stop using your eyes if they hurt", "Always wear your glasses". Assistance in the conduct of these classes is given by the Division of the Blind of the Massachusetts State Department of Education.

3. *Classes for Mentally Retarded Children* (137 in number)

Pupils in the regular grades who fall below standard are recommended to the examiner of the Special Class Department for mental testing. If they are determined to be of the improvable type for Special Class work and if the parents approve, such pupils are transferred to a Special Class where methods adapted to their needs are used for academic, physical and manual training. Special attention is given to character building, to health education and to mental hygiene. Special Classes are doing excellent work in these fields.

4. *Speech Improvement Classes*

Any child who has a speech defect of any type may enter a speech improvement class upon the suggestion of parents, classroom teacher, physician or nurse. Children generally spend three hours per week at such a class. Inasmuch as many of these pupils present behavior problems, a great deal of training in mental hygiene is accomplished in these groups. Nurses and physicians are coöperative in securing the correction of defective tonsils, teeth or other structure which may retard fine correction of speech defects.

5. *Classes for Children with Defective Hearing*

a. *Lip-Reading Centers.*

Children with a hearing loss of 9 or more sensation units (shown as a result of the audiometer test) are referred to an otologist who may recommend treatment, work in lip-reading classes, or both. Children found in Grades I-III are given instruction by a visiting teacher who goes to their individual schools. Pupils in Grades IV to XII go to lip-reading centers, located in various school districts throughout the city. The amount of instruction varies from one to two and one-half hours per week, depending upon the age and grade of the child. A particularly useful type of health instruction is that given by teachers of lip-reading classes to children in the upper grades concerning the choice of an occupation. All such pupils are advised to choose some type of work in which normal hearing is not essential. Children whose hearing defect is so great that they are unable to profit in their regular school classes with supplementary training in lip-reading, are eligible for entrance into the Horace Mann School for the Deaf.

b. *Horace Mann School for the Deaf.*

At this school a very specialized type of health instruction is being given by a well-trained teacher, who takes charge of this work in all grades above the second. In Grades [illegible] to VI, thirty minutes per week is used for a teaching lesson in health. In Grades VII, VIII, and IX, four thirty-minute periods per week are devoted to Health and Science. All material is developed strictly on such a basis as to appeal to and meet the needs of particular groups of children, many of whom have very definite and specific health problems.

Textbooks are used for the most part as reference material. There is a library of approximately fifty different health texts covering physiology, hygiene, and sanitation, and including some health readers. The children are allowed to read these when they have finished work in other subjects. They also frequently enjoy the privilege of taking books home overnight.

Visual material plays a large part in the education of the deaf. A moving picture, film strip or set of lantern slides is used each week for teaching a health lesson in Grades VII, VIII and IX. Moving pictures are also used for assemblies of the whole school. The school possesses a very fine equipment of visual materials, and others are readily obtainable from outside groups in Boston.

Handwork is also done by all classes. Materials from the New England Dairy and Food Council are much in demand. Excellent posters, notebooks, and scrapbooks are made by these children. A notebook, in which reports of experiments in health and science are written, is kept by each pupil through Grades VII, VIII and IX.

Correlations with Home Economics in which the older girls are taught lessons on Foods; with Art for poster work, and with Physical Education for the teaching of recreation and for posture correction are excellently developed.

6. *Instruction for Crippled Children*

There are 16 visiting teachers who spend from 2 to 3 hours per child weekly instructing crippled children in their homes.

D. Special Schools

1. *Continuation Schools*

Pupils between the ages of fourteen and sixteen who have left the regular school in order to secure employment are required to spend four

hours per week in a Continuation School—of which there is a Boys' and a Girls' Division in Boston. All students in these schools are under the careful supervision of a full-time physician and a nurse, who secure the correction of remediable physical defects before issuing employment certificates. Approximately eight thousand different pupils attend the school within a year.

The program of each pupil is divided into two hours of practical and two hours of academic work. The latter includes English, Arithmetic and Hygiene, each of which is related to the practical job the child is undertaking. Each instructor teaches all of the academic subjects to his groups.

The general course in Hygiene covers both its personal and industrial aspects, and is taken up under the following section headings: (a) The pupil in relation to himself, to the home, and to the employer; (b) The employer in relation to the pupil; (c) The pupil in relation to the community; (d) Public Hygiene; (e) Safety first on the job.

The course aims to teach the pupil the importance of good health to himself, to his family and to his community; to make him realize that good health is a valuable asset, not only because it increases his earning power, but also because it provides for greater enjoyment of life.

An important element in the health improvement of pupils in continuation schools is that arising from the visit of the teacher to the pupil in his place of employment and the visit of the teacher to the home of the pupil.

2. *Trade Schools*

The Boston Trade School (for boys) and the Trade School for Girls exist for the training of persons over 14 years of age, who have completed the eighth grade in the elementary school, and who can spend from two to three years furthering their education, to enter industry.

The regular medical service is extended to the Boston Trade School. Pupils here, as in the general high schools, receive instruction in military drill. The regular ninth-grade course in Hygiene is given to entering students. Boys in the advanced class are also given instruction in Industrial Hygiene, directly related to the shop work which they are undertaking.

At the Trade School for Girls, a very comprehensive health program has been developed. Each girl receives the benefit of the routine medical and nursing service. Excellent work for the correction of faulty posture is being accomplished by the physical education department. A course in Personal Hygiene is compulsory for every girl for one 45-minute period per week during her first five months at the school. Textbooks are used for reference only. A parallel course in Industrial Hygiene is required of all girls during the last five months of their Senior year. The subject-matter for this course is based on the Massachusetts Department of Labor and Industry: *Regulations for the Health of Workers.*

There is an excellent correlation of health with the course in Foods and that in Clothing and Dress Appreciation, both of which are required of all girls. More detailed instruction in food values and dietetics is given to girls who are studying in the Catering Course.

The lunchroom at the Trade School for Girls is distinctly a health project. The girls are taught the right food and diet for persons engaged in different occupations and are supervised in choosing a menu suitable for the type of work which they have been pursuing during the school day.

3. *Boston Clerical School*

The Boston Clerical School receives girls from the Boston High Schools and trains them for clerical positions. The student remains until the prescribed program of work is completed. The instruction is strictly preparatory for clerical work and does not include direct health instruction. Lectures on health are given occasionally at assembly periods.

The school has the services of a school physician and the full-time services of a matron. Physical examinations are given annually and continued supervision over pupil health is maintained. A lunchroom service is operated by the Women's Educational and Industrial Union.

1. The Teachers College of the City of Boston

Beginning with the fall of 1930, all entering students at Teachers College were required to enroll for a four- or five-year course. At this time, the course in health education which had previously been given during the second year was transferred to the first year. At present the following courses are being offered:

1. All first-year students are required to take a course in health for three periods per week throughout the year. This course consists of a study of health problems based upon the essentials of anatomy and physiology. It aims to arouse in the students a desire for the maintenance of hygienic habits and an interest in the furtherance of personal, home, school and community hygiene. Laboratory work and training in First Aid are also included.

2. All third-year students may elect physiology for four periods per week for one semester.

3. Courses in health education methods required during the senior year include (a) for those students pursuing the kindergarten-primary curriculum, a one-hour course for one semester, (b) for those students in the elementary curriculum, a two-hour course for one semester.

As a part of the extension work of the college, courses in health subject-matter are given to teachers in service.

(To be concluded)

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

TYPES OF ULCERATIVE COLITIS

CASE 19021

MEDICAL AND SURGICAL DEPARTMENTS

PRESENTATION OF CASE

DR. HENRY D. STEBBINS:* This is the case of a twenty-two year old American girl sent in by Dr. C. M. Jones and Dr. McKittrick, who saw her in consultation at home.

She had had diarrhea for four weeks, more or less bloody for the past three weeks. The year previous to admission she was under considerable strain, working hard, losing weight and becoming run down. For three months she had had considerable morning fatigue and frequent colds. One month before admission she was taken suddenly with a chill with a temperature of 103° and had watery diarrhea, two or three movements a day, none at night. She had had no headache, no pain and no vomiting. She continued in about the same condition for a week, during which she worked four or five days. Three weeks before admission she began to notice blood in her stools, at first half an ounce of pure blood, after that from a few drams to an ounce in each stool. The temperature was elevated, being 103° by mouth almost every day. She had some night sweats, especially from the time the blood appeared. She had had no pain until two weeks before admission, when she had midabdominal cramps. These were partially controlled with medicine containing opium. She vomited twice during the week before admission and developed a rather painful hemorrhoid.

The family history is interesting in that a brother died at eleven with ulcerative colitis which so far as is known was of the idiopathic variety. He was operated on by Dr. McKittrick and an ileostomy performed.

The social history is unimportant except that the patient was a nervous, hard working, conscientious person who did not keep her weight up very well.

She had had pneumonia at the age of eight and diphtheria in 1928. Her best weight was 142 pounds, seven years ago. Her usual weight was 125 pounds. She lost about twelve pounds during the three weeks before admission. Her weight on admission was 113 pounds. There was no history of previous diarrhea.

On entry to the hospital she was a thin, flushed, dehydrated girl with a temperature of 102°. The pulse was 150, the respiration normal. Physical examination was practically negative except for dehydration and tenderness in the lower abdomen and the anal region, which was not examined.

Laboratory tests showed the red count 6,300,000, the hemoglobin 80 per cent Tallqvist, the white count 23,000, 83 per cent polymorphonuclears, no eosinophilia. A Hinton test was negative. The blood chlorides were 484.

She had from two to seven watery movements a day during the first few days, mostly of tomato juice color and totaling up to 1200 cubic centimeters every twenty-four hours. Twenty examinations were done for amebae, but none were seen. There were no ova or other parasites. There were no positive cultures from the stools for typhoid, Bargen's or dysentery bacilli, although numerous cultures were made. Agglutination was negative for typhoid, paratyphoid and dysentery. She had eleven positive guaiac tests and grossly bloody stools during the first six days, after which the guaiac was only occasionally positive and frequently negative, although the quantity was still about 1200 cubic centimeters a day.

The treatment was high vitamin, low residue and strained diet with 200 cubic centimeters of glucose intravenously in saline daily for a week.

Dr. McKittrick saw her the day after she came in and advised trying yatren if the dietary treatment did not help. This was started on the ninth day after admission. Transfusion of 500 cubic centimeters of citrated blood was done on the seventh day. The temperature went up to 104° and she developed left sided acute parotitis. On the ninth day she developed edema of the ankles and the lower parts of the legs. The serum protein was 4.4 per cent. The red count was 4,400,000, the white count 15,000, and she looked much better clinically. She had a chill following intravenous 25 per cent glucose. The striking thing about her that day is that her total stools were only 300 cubic centimeters and from that time not over 700 cubic centimeters, whereas before she had had 1200 to 1500 cubic centimeters. Two days later, eleven days after admission, she vomited. The abdominal distention was more than usual. The temperature dropped from 104° two days before and did not again rise above 100° while she was on the Medical service.

Transfusion was done on the thirteenth day after admission and she was operated on the same day, ileostomy being performed. The white count was 20,000. The temperature had not risen. At operation a large amount of malodorous gas escaped from the abdomen when it

*Junior interne on the East Medical service.

was opened. The abdomen was practically filled with cloudy fluid with shreds of fibrin in it. No attempt at exploration was done. A drain was made in the left lower quadrant and ileostomy done.

She lived eighteen hours after operation and died with a temperature of 107° and a pulse of 160.

Clinical Discussion

Dr. Stebbins: The diagnoses on discharge were idiopathic ulcerative colitis and general peritonitis.

Dr. Chester M. Jones: I am sorry that Dr. McKittrick is not here. He operated on these cases and could probably tell you more about them.

I saw this patient in Rhode Island three days before admission. There were two or three points that interested me. It was perfectly obvious that she was extremely ill. For about two hours I tried to persuade the doctor and the family to send the patient to Boston. They finally consented, but could not arrange it for about two days. I proctoscoped her at that time. She presented a proctoscopic appearance with which I am not particularly familiar. I could get the proctoscope in only a short distance because of pain from the hemorrhoid. The mucous membrane was diffusely inflamed. It was so red that the appearance was that of red velvet. It was fissured all along in almost branching fissures, as if the mucous membrane were brawny and cracked readily. I could not be sure of any ulceration at all, there was so much bleeding. It presented a picture that is not seen commonly. It must have been a very fulminating condition, involving certainly the entire lower bowel and quite probably the whole colon, and the prognosis was certainly extremely dubious.

I was told that the patient had no anemia and that the case was not very severe. The red blood count of 6,000,000 bore out that statement. She was so excessively dehydrated that the red count was very high. It should have been about 3,000,000 with proper hydration.

This is the only patient I have ever seen who had another similar case in the family. Perhaps that is merely a coincidence, but it is rather interesting. Of course the fact that she had seen her brother die of this disease delayed her appearance in the hospital because of fear.

I think if any mistake was made it was that she was not operated upon as soon as she arrived in the hospital. We talked the case over even before we had seen her; we knew the family, and we thought we might be headed towards an ileostomy shortly after she arrived. I think in another case in which the condition is such a fulminating one, ileostomy within a day or so after admission, after an attempt had been made to supply a large amount of fluids, should be an obligatory matter. I should like to know what Dr. Daniel Jones thinks about this.

Dr. Daniel F. Jones: This case is of a very definite type which fortunately does not appear often but does appear every now and then. I have seen two of these cases following childbirth and a third—so many years ago that I do not remember much about it—in a young girl whose family had nothing done and who died within a few days.

My personal opinion is that this condition has very little to do with the real chronic ulcerative colitis. I think it is due to a bacterium which is very virulent and makes these people very ill. I am sorry to say that I have not much faith in ileostomy to stop this disease, although I would advise it as early as possible. In one of the cases I have seen there was ulceration through the rectum into the vagina and two or three very deep ulcerations could be seen in the rectum. That was a patient of Dr. C. C. Lund, who asked me to see her with him. He not only did an ileostomy but cut the sphincter in order to give all the drainage possible. That woman pulled through.

The other case was of the same type. The patient came from Hartford, where she had been delivered. She went down to nothing but skin and bones. Then she picked up a little, came up here and began to bleed profusely again. We did an ileostomy and she went on bleeding just the same as if we had not done it. We finally gave her yatren, which seemed to do something. I am not sure that it did. The temperature came down a little. We did two or three transfusions and finally she gradually picked up and has left the hospital within three or four weeks. She has I understand continued to improve.

That these cases are very virulent is shown by this case which Dr. Chester Jones has reported, in which there was perforation, and the case of Dr. Lund's of which I have spoken, in which there was an ulceration from the rectum directly through into the vagina. The severity of these cases in every way makes them a very important group. I would advise doing everything you can think of as early as possible, including an ileostomy, and I should not hesitate to cut the sphincter if necessary. If you get a predominating bacterium I would not hesitate to give vaccines.

Dr. Chester M. Jones: Should you say that the others had the same proctoscopic picture? It is difficult to believe that any medical therapy would help at all.

Dr. Tracy B. Mallory: Yes, very difficult. This is the type of case that would be apt to perforate.

Dr. D. F. Jones: I agree. It is an entirely different group from the ordinary chronic ulcerative colitis, it seems to me.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Ulcerative colitis.
General peritonitis.

ANATOMIC DIAGNOSES

Acute ulcerative colitis.
Perforation of the sigmoid.
Generalized peritonitis.
Operative wounds, ileostomy.
Mural endocarditis, right and left ventricles.
Acute mitral endocarditis.
Pulmonary infarction.
Chronic pleuritis of the right apex.
Intrahepatic portal thrombosis, right.
Central necrosis of the liver.

Pathologic Discussion

Dr. Mallory: The autopsy showed involvement of the entire large intestine starting at the level of the ileocecal valve, becoming gradually more intense as it went down the intestine and reaching its maximum point as it reached the cecum. The distribution is essentially that of ulcerative colitis.

I will read the description. "Thirty centimeters from the anus there is a perforation of the sigmoid on the anterosuperior surface measuring 1.3 centimeters in length and 0.2 centimeters across. On the superior surface of the transverse colon there is a second perforation one centimeter long which is probably traumatic in origin, caused in an attempt to free the great omentum from this area. All the loops of the small intestine are bound together by large numbers of fibrinous adhesions. The parietal and visceral peritoneum appears thickened and has a grayish-yellow opaque appearance. There is an ileostomy opening 15 centimeters from the ileocecal junction.

"The peritoneal surface of the large intestine, starting at the ileocecal junction and continuing to and including the rectum, has a grayish opaque appearance and is covered with hemorrhagic areas. In the regions of the transverse colon, the iliac colon and the sigmoid colon the bowel has a grayish-black necrotic appearance and must be handled with care to avoid tearing the wall. The largest of the necrotic areas is in the sigmoid colon, involving the entire circumference and extending along the bowel for a distance of 15 centimeters. On opening the colon it is found to contain very little fecal material and a large amount of bright bloody, sticky mucous material, particularly in the sigmoid and rectum. The wall is greatly thickened, measuring 0.5 centimeters in many places. Starting in the region of the cecum and continuing through it to the anus is an increasing amount of ulceration of the entire thickness of the mucosa. In the cecum and ascending colon these ulcerations are scattered throughout the entire wall, the larger ones measuring as much as 1.5 centimeters in diameter. The edges of these ulcerations are undermined, often as much as 0.5 centimeter. The floor of the ulcers in many instances is made up of the muscular wall of the bowel, while in the more superficial ulcers it is injected and covered with grayish areas of necrotic tissue. There is a rapid increase in the number of ulcers as one passes along the colon from the hepatic flexure to the splenic flexure. From there on the ulcers are continuous with each other in a longitudinal fashion. These elongated continuous ulcerated areas are separated by longitudinal islands of injected, thickened, edematous mucous membrane. The edges of these areas of mucous membrane are often so markedly undermined that a patch measuring 3 centimeters long and 1.5 centimeters wide is attached to the underlying muscularis mucosa by an area measuring approximately 0.5 centimeter in diameter. In the sigmoid and rectum the ulceration is so marked that only occasional small patches of mucous membrane, most of them measuring less than 0.5 centimeter in length, are found. In the sigmoid region the muscular wall of the bowel which forms the floor of the ulcer is necrotic over an area approximately 8 centimeters by 3 centimeters. It is near the center of this that the perforation is found."

We also found numerous other things which are all essentially complications following the perforation in the sigmoid. There was a general peritonitis. There was also an intrahepatic portal thrombosis in one lobe of the liver only.

There was an acute mural endocarditis of both the right and left ventricles and acute endocarditis of the mitral valve. The mural endocarditis is distinctly unusual.

CASE 19022

Surgical Department

PRESENTATION OF CASE

Dr. David W. Wallwork*: *First admission.* This patient was a young woman twenty-seven years old, a white single native stenographer, who entered the hospital complaining of diarrhea and bloody stools during the previous three weeks.

For seven months she had had slight amounts of rectal bleeding which she had attributed to hemorrhoids, but for the past three weeks, since attending a banquet following which others besides herself were ill, she had had diarrhea amounting to a movement every half hour during the day and four or five times at night, each movement watery and bloody and accompanied by abdominal cramps. For four days previous to entry she had noted fever and had had some real shaking chills.

*Recently senior interne on the East Surgical service.

On entrance her physical examination was essentially negative except for some voluntary rigidity of the abdomen, some tenderness in the left lower quadrant and flank, tenderness by rectum, and a "granular" feeling rectal mucosa. Her weight was 78 pounds.

The urine was negative. The white blood cell count was 13,000, the red blood count 3,760,000. The stools were tinged with blood but negative for bacillus typhosus and paratyphosus, bacterium enteritidis, for amebae and for tubercle bacilli. A Wassermann, a blood culture and a Widal were negative. Dr. Clifford isolated from the stools an unidentified organism which agglutinated in the patient's serum and made from this organism a vaccine with which the patient was subsequently treated.

The temperature was 101°, the pulse 140, the respiration 25.

X-ray showed a smooth sigmoid and colon with absent haustral markings and a narrowed lumen.

Dr. D. F. Jones did a proctoscopy at this time, made a diagnosis of ulcerative colitis and advised ileostomy.

The patient was in the hospital five weeks and was given boiled milk, various enteritis and colitis diets, vaccine, starch enemata and starch and opium enemata with acriflavine. At the time of discharge she was slightly febrile and had lost some weight, but her diarrhea and intestinal bleeding were less. She was to go home for two months to try the vaccine, a low residue diet and starch enemata.

Second admission. She returned two months later, still having four to five imperative stools a day but feeling stronger and weighing slightly more. The other findings were unchanged. Dr. McIver did an ileostomy under ether. Although the patient had considerable postoperative reaction, she was discharged distinctly improved eighteen days after operation.

Third admission. Her next entry was seven months later, when she returned for a period of rest and observation after some increase in the number of stools and the amount of blood in them for the past month following an injection of vaccine. In general, however, she had made real improvement. Her appetite was better, she had gained fifteen pounds and her red blood cell count had risen one million, to 4,880,000.

Fourth admission. Two and a half years later she entered for metabolic studies of the effect of various diets on her ileostomy. Her appetite was excellent, her weight constant at 92 to 95 pounds, her ileostomy was functioning well, the discharge was less fluid and did not cause irritation. The only disturbing thing was the occasional embarrassment caused by the discharge of gas from the ileostomy. She was having a small amount of bloody discharge from her rectum only once every three or four months.

At this time her rectum was found narrowed and scarred as the result of some healing. The proctoscope could be introduced only 10 centimeters.

She developed a perianal abscess which required surgical drainage, but otherwise did well and gained six pounds.

Fifth admission. Ten months later she entered again, four years after the ileostomy, because her rectal bleeding had increased until about every six weeks she would bleed for a day or a week, losing "a cupful of blood three to four times a day". There was no weight loss or loss of strength. The red cell count was 4,100,000, the hemoglobin 75 per cent.

Dr. D. F. Jones did a colectomy under ether, attaching the remaining segment of rectum and rectosigmoid to the abdominal wall. The entire colon was seriously diseased, but less so at its distal end. The patient made an excellent convalescence except for a severe cystitis which required prolonged constant urethral drainage. There was some minor wound infection.

Sixth admission. The patient's last entry was a year and a half later, when she was readmitted for rest after two hemorrhages from the remaining segment of bowel. The bleeding quickly subsided and Dr. D. F. Jones felt that operative removal of the remaining bowel was unnecessary.

At this time the patient weighed 118 pounds (original weight 78 pounds). She was perfectly content and physically the picture of health. She was rather anxious to have the remaining bowel removed to avoid possibility of further trouble after marriage.

Clinical Discussion

Dr. Chester M. Jones: This is a case that Dr. Daniel Jones and I followed for a long time. I think the patient represents the whole picture of ulcerative colitis from beginning to end. She started off with a characteristic onset, acute in nature, and came in here reasonably sick. An organism was found which apparently was in the paratyphoid group, although not classified at the time. That was as near as we could get bacteriologically. She had one remission and a relapse. Her nutrition was poor and she was not gaining in weight. It was finally decided that an ileostomy was the proper form of treatment.

Ileostomy was done successfully and she did what most of these cases do, regained weight steadily and improved in general appearance.

I saw her on and off after her discharge. The only important thing she complained of was the occurrence of repeated hemorrhages. All the other complaints amounted to nothing but a little annoyance from the ileostomy. The hemorrhages recurred at decreasing intervals and

apparently became more severe with each attack. Finally Dr. Jones and I talked it over and agreed that it would be worth while to remove the cause of the hemorrhage, namely the colon. In about six months' time the patient had accepted the idea. A colectomy was then done. Interestingly enough she has had further bleeding from the remaining portion of the sigmoid. In other words the disease is one that is not cured by ileostomy. As long as the colon stays in the body it is a source of hemorrhage or infection or both. She has done extremely well, however, is the picture of health, and no one would guess that she had been sick at all. Her nutrition is extremely good; in fact she is overweight. Whether we shall have to go after the remainder of the sigmoid is a question, but my guess is that we probably shall not. It may become nothing but scar tissue. As to the statement that the distal end of the colon showed less disease than was expected, I think the condition there may be scar tissue from previous disease. Usually the disease starts in the rectum and works up to the ileocecal valve.

She has now gone a good many years not at all incommoded by the ileostomy. The only worry at present is whether or not she shall marry. She has been advised to do so but to avoid pregnancy because of the danger of obstruction.

Dr. Daniel F. Jones: I should like to say that I consider this a typical case in every way, not only as to the symptoms but from the point of view of treatment and the course of the disease.

There is one thing that must be understood, and that is that an ileostomy does not cure this disease. It cures the patient, but it does not cure the disease. I can show you any number of patients who have had an ileostomy who are apparently well; but when we come to look at the rectum it is just as bad as the day we did the ileostomy. Is that true?

Dr. C. M. Jones: Yes, that is correct.

Dr. D. F. Jones: It is all very well to say that ileostomies are of no value and we should not do them, but as we are unable to cure any of these cases here by the Bargen vaccine or serum, up to the present time we have no way to cure the patients except by ileostomy, at least I have not learned of any way. There are a few mild cases that go along without an ileostomy. One should not do it unless it is necessary because the patient cannot be cured without it. When a patient is down to 78 pounds, however, it seems to me something ought to be done.

I have a patient who was operated on at this hospital, a young girl who was nothing but skin and bones at the time. She now weighs 175 or 180 pounds and has been in perfect health, or I should say she was in perfect health until the time a colectomy was done. That patient was sent to Dr. Bargen himself. He said he would take the patient but he wanted me to understand that after an ileostomy was done the vaccines did not seem to do much good. In other words, he is talking about one class of case and we are talking about another. He made a statement at the meeting of the Gastro-Enterological Society some years ago that he cured 90 per cent of these patients. I am willing to state that at this hospital we do not cure more than 10 per cent of cases of what we call chronic ulcerative colitis. I think we do not cure even 10 per cent, do we?

Dr. C. M. Jones: That is what we are trying to find out. I doubt it too.

Dr. D. F. Jones: The ileostomy did very well, but she was bleeding and could not keep on with her work. I think work is a very important part of the average person's life, especially that of a person who must depend upon work for a living. This girl could not keep on with her work because of the bleeding. She was very anxious to have something done about it. I said, "You think an ileostomy is a terrible thing, as I do. You know that if we take the colon out it is the end of using the colon." She said, "That is all right. If you stop the bleeding I do not care." So we took out her colon. It is quite possible that the rectum will have to come out. She looked so well the day I saw her and had bled only once or twice for such a short time that realizing what it means to take the rectum out I did not feel like putting her through that ordeal.

There is one more thing to which I should like to call your attention, that is that in the acute case you found portal thrombosis. I have never seen a portal thrombosis with these chronic ulcerative cases, nor have I ever seen an abscess of the liver. That is a very queer thing. Here is an ulcerative condition in the colon, and yet there are very few cases of any infection of the portal system. There are many things about chronic ulcerative colitis that make one feel that it is not an infection, and that is one of them.

DIAGNOSIS

Ulcerative colitis.

Pathologic Discussion

Dr. Tracy B. Mallory: The surgical specimen here showed a relatively acute process in the cecum with numerous petechial hemorrhages scattered through the mucosa and a very much more chronic process in the transverse colon with much more fibrosis. We found several areas where the ulcers were so deep that they penetrated through the muscularis and only a thin remnant of the wall remained. She must in the past have been several times very near complete perforation and general peritonitis.

CASE 19023

Surgical Department

PRESENTATION OF CASE

Dr. Walter E. Garrey:* *First admission.* This is a fifty-nine year old American store owner who was first seen twelve months ago on the Medical service with the complaint that he had had diarrhea ever since he could remember and increasing general weakness for a year and a half.

He said that he had had ten to fifteen bowel movements a day all his life and that they had always been loose in character. He had had considerable tenesmus and from time to time cramping pains moving from the right to the left of the abdomen, relieved to some extent by defecation. He had never had rectal bleeding, although he had passed small amounts of mucus. His weight averaged about 125 pounds. During the past year it had dropped so that he had not been over 110 pounds. Treatment with seedoxylin, lactodextrin and acidophilus gave very slight benefit.

He had an attack of right upper quadrant pain diagnosed as gall stones at the age of forty, chancre treated with blue ointment at the age of twenty.

When he entered the Medical service he was poorly developed and nourished. He had a soft blowing precordial murmur. The abdomen was rather distended and slightly tender in the right upper portion. Rectal examination disclosed numerous small shot to pea sized masses along the rectal wall, thought to be polypi. The hemoglobin was 80 per cent, the red count 3,900,000, the white count 4,300, the smear normal. The urine was normal. Wassermann and Hinton tests were strongly positive. The stools were negative to guaiac. They showed 15 to 20 white cells microscopically.

On x-ray examination with a barium enema the appearance suggested ulcerative colitis. All through the bowel were rounded defects thought to be suggestive of polypi. There was also a constriction in the midportion of the descending colon thought probably to be due to scar tissue. Examination with a barium meal was negative. There was a stone in the gall bladder.

Proctoscopy demonstrated numerous polyps in the rectum and rectosigmoid, also ulcers along the rectal wall. The pathologic report on a biopsy specimen was "polypoid hyperplasia".

It was felt that he should have a colectomy. The first stage was done two weeks after entry, an exploratory laparotomy under spinal anesthesia and an ileostomy. The entire large intestine was dilated to twice the normal size, thickened, edematous and quite rigid. His convalescence was not remarkable.

History of interval. That winter he went to Florida. He did quite well and increased his weight to 127 pounds. He took some mercury and iodide by mouth as treatment for his latent lues. The bowel movements were reduced to four or five a day. He passed chalky material and a little mucus. He had three or four chills during the winter.

Second admission. When he reëntered he was again seen on the Medical service and was found to be in better general condition than at his previous entry. His hemoglobin was 55 per cent, his red count 4,200,000, his white count 10,000.

He was kept on the Medical service for two weeks and a half. Then it was felt that even though he was an elderly man he should have a colectomy. This was done by Dr. McKittrick. The patient had two transfusions of 500 cubic centimeters, one during the course of the operation and one at the end. Troublesome bleeding was encountered in the region of the hilum of the spleen. The distal end of the rectosigmoid was implanted in the abdominal wall.

His convalescence was complicated by a small abscess in the stab wound in the left flank and one in the abdominal wound; but on the whole he did very well.

*Interne on the East Surgical service.

Clinical Discussion

Dr. Chester M. Jones: This case is a little out of the ordinary, in the first place on account of the duration and in the second place because of the relatively low grade ulcerative colitis associated with polypi. Whether they were the cause or the result is very difficult to say. There is a group of these patients that develop polypi which are fibrous in nature due to the chronic inflammatory process with the associated denudation of the mucosa, and another group that have adenomatous polyps, and we have cases that show both conditions.

It was felt in this particular instance that in spite of his age there was a fair chance of completely curing him by first doing an ileostomy and getting him in better condition and then doing a colectomy to avoid two things—first the possibility of malignant degeneration, and second to get out a definitely septic area that was bleeding and producing anemia. It was done successfully and he is now in perfect health.

DIAGNOSES

Ulcerative colitis.
Multiple polyposis of the colon with adenomatous degeneration of some of the polyps.

Pathologic Discussion

Dr. Tracy B. Mallory: The specimen in this case showed most of the typical changes of ulcerative colitis and also, as they noticed on proctoscopy, a rather marked degree of polyposis. Two types of polyps were found, some of

which appear to be adenomatous, and although smaller are not histologically different from the single or multiple adenomatous polyps that one sees so commonly in the rectum. They lie in the indefinable borderland between hyperplasia and neoplasm. A second type of polypoid mass, indistinguishable grossly, showed nothing microscopically but inflamed granulation tissue.

He had one other finding which in my experience is rather rare in ulcerative colitis, that is a very marked localized stricture. At one point the colon was diminished to less than one third the normal diameter. It strongly suggested that a complete intestinal obstruction might have resulted in a very short period.

CASE 19024

Medical and Surgical Departments

Presentation of Case

Dr. David W. Wallwork:* *First admission.* A white married native store manager twenty-six years old entered three years after the onset of fever, malaise, vomiting and diarrhea with bloody stools.

A few days after the onset of his illness he was operated on for hemorrhoids, then for fissuring, later for fistula. These operations required about two months in bed. The diarrhea and weight loss continued until his weight fell from 150 pounds to 67. After this he spent five months in a hospital, where he ran a rather stormy course. In the end the rectal bleeding stopped and he began to regain weight and strength.

During the next two years he had been well until about six months before entry, when he found he was unable to find work. He thought the mental upset accompanying this had started the diarrhea again. He began to have anorexia and malaise. He reëntered the hospital, where he passed stools with "30 per cent blood and 70 per cent water." Four months before entry, one month after he entered the hospital, ileostomy was done. He was very ill, with a temperature of 104° and a pulse of 130 to 140. After about a month he began to show improvement. Three months before entry he began to have numbness, weakness and tingling of arms and legs, and some tenderness along the courses of the nerves in his legs. One month before entry he was considered well enough to go home and was allowed to sit up, but he suddenly developed an extreme tachycardia of 160 with cyanosis and a blood pressure of 70/60. He improved with oxygen and digitalis. Four days before entry he was seen by Dr. P. D. White, who thought he had a normal heart, ulcerative colitis and slight psychosis, because ten days before he was admitted to this hospital, six days before Dr. White saw him, he suddenly refused to talk and his mentality became that of a small child. He sang a good deal, but apparently had no hallucinations.

His physical examination at entry showed a rather well developed but very poorly nourished man in no apparent discomfort. His ileostomy was functioning well. There were various minor findings. Many of the clinical signs were of a peripheral neuritis, including tenderness along the course of the nerves to the legs.

The urine was negative. Blood examination showed 5,750,000 red cells, hemoglobin 70 per cent, 10 per cent eosinophiles, 36 per cent lymphocytes.

He was kept in the hospital about two weeks, during which time he suddenly "awakened", wanted to know what had been happening to him during the previous five months. After this he improved steadily. He was discharged with a diagnosis of ulcerative colitis, peripheral neuritis and psychosis.

History of interval. After he left the hospital he gained about twenty pounds. He had constant increase of strength in his legs. He had one to five bowel movements a day, with considerable blood, three pints in six days according to his wife. At the same time he had some urgency. One week before his second admission he began to have loss of appetite and weight, drowsiness, increase in the amount of blood in his stools and a feeling of numbness in his fingers and toes. His mental symptoms had disappeared.

Second admission, three months after his discharge.

The general physical examination was negative. His neuritis had apparently cleared somewhat. Proctoscopy showed a "raw beefsteak", bleeding mucosa.

He was selected as a candidate for colectomy and was transfused twice. His condition on return to the ward was only fair. He was given another transfusion with good effect. For four or five days his temperature was 103° to 104°, but it suddenly came down to 99.5° and never went above that during the rest of his stay in the hospital. He did very well and was allowed to get up and walk about with the aid of a frame. Just before discharge he had an attack of clear watery diarrhea. After this he gained and went home much improved.

Dr. George W. Holmes: This film shows the constricted, indurated appearing bowel which is rather characteristic of this disease. In the lower portion there is a suggestion of the serrated appearance that we see sometimes in ulcerative colitis.

Clinical Discussion

Dr. Holmes: As you have seen from the discussion, the x-ray plays a minor part in the diagnosis of these cases. Proctoscopy is always

*Recently senior interne on the East Surgical service. Owing to his absence in Europe it has been necessary to publish this report without Dr. Wallwork's revision.

much more effective. One might think the x-ray would be of some help in determining the extent of the disease. A method which ought to detail these shadows much better is the injection of air following a small amount of barium. I think it is possible by that method to get a fairly good picture of the mucosa of the colon, but there is a certain amount of risk with the type of cases shown to-day. With such a patient as the man you have just been discussing the injection of air could easily produce a perforation. For that reason we hesitate to do it here, especially since it does not add greatly to the diagnosis.

Dr. Chester M. Jones: This last case is of interest because it shows practically all the complications that one can see in the disease. Most patients if followed carefully will develop some type of deficiency, and anemia from hemorrhage or from insufficient diet. This man developed practically the findings of beri-beri. He had I should think a typical attack of beri-beri, a type of heart dilation with a very rapid pulse coming on suddenly and nearly resulting in his death. The psychosis was certainly due in part to malnutrition and may have been associated with cerebral lesions. He had a fully developed peripheral neuritis which was still present at his second entry to the extent that we could not get his knee-jerks or ankle-jerks, but this summer he could walk half a mile and swim as far as fifty yards without any real difficulty. He had a marked stomatitis and colitis during the course of the disease, quite similar to what one sees in pernicious anemia or sprue. He had a pustular skin eruption which we do not see in these cases. He had all the peripheral nerve manifestations that can appear, possibly exaggerated by the ileostomy, because in this instance that provided a very rapid emptying of his bowels. He was not having a balanced diet at first. Under an extra careful high vitamin, low residue diet he improved fairly well during his first admission. At home he continued to improve up to a certain point, but beyond that showed no signs of improvement. I felt that possibly an actual factor in his failure to improve further was the infected colon, just as a septic focus in pernicious anemia will prevent proper response to otherwise adequate treatment.

We all thought after talking it over that colectomy was worth while. He did very well after the colectomy and at present looks better than he has for some time. He is almost back to his normal weight and as I have said has recovered strength enough so that he can swim fifty yards without fatigue. His gait is not good as yet, but probably will recover completely in due time.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Ulcerative colitis.
Peripheral neuritis.

PATHOLOGIC DISCUSSION

Dr. Tracy B. Mallory: The gross appearances were again typical of an ulcerative colitis.

This first section is from the ascending colon, which is on the whole least involved. A fair number of intestinal glands are present here. There is a marked thickening of the mucosa by an infiltration of lymphocytes, plasma cells and a fair number of polymorphonuclears. A few glands are greatly dilated and packed with polymorphonuclears. These represent small miliary abscesses. Similar conditions have been found in the lower sigmoid on proctoscopic examination in very early cases. This cannot be regarded as a perfectly typical early lesion because we have a marked fibrous thickening of the submucosa, four or five times as thick as it should be. So that although the ulceration in this region is not so marked as elsewhere and the mucosal changes are more like early ones, we know that the process must have been going on for a long time.

In the transverse colon the process has extended further. Only a few intestinal glands show there. Along the edge of the ulcer they have disappeared entirely. The ulcer shows a base of inflamed granulation tissue, but the process has not quite come down to the muscularis as yet. The last section is from the sigmoid, and here the ulcers are in places right down to the muscularis.

Dr. White, have you a word to say on the effects of beri-beri on the heart? I think it is a totally new subject to all of us.

Dr. Paul D. White: This case I was called out to see because of persistent tachycardia; the cardiac condition was obviously largely functional, the effect of some influence on the heart, not heart disease. Although beri-beri has been written about extensively, especially in the far East and the Dutch East Indies, we almost never see cases here. The beri-beri heart is said to show increased size, due to dilatation primarily; there is also edema actually of the muscle itself, with cardiac weakness, disturbance of rhythm, congestive failure and general weakness. I am not however particularly familiar with the subject, having seen to recognize only two or three cases that like the one recounted here might be considered as mild instances of the beri-beri heart. Proper diet, including especially the antineuritic vitamin B, quickly clears up evidences of the beri-beri heart when not far advanced.

The New England
Journal of Medicine

SUCCESSOR TO
THE BOSTON MEDICAL AND SURGICAL JOURNAL

Established in 1828

Published by THE MASSACHUSETTS MEDICAL SOCIETY under the jurisdiction of the

COMMITTEE ON PUBLICATIONS

HOMER GAGE, M.D. JOHN W. BARTOL, M.D.
ROGER I. LEE, M.D. ROBERT B. OSGOOD, M.D.
RICHARD M. SMITH, M.D.

EDITORIAL STAFF

REID HUNT, M.D. STEPHEN RUSHMORE, M.D.
JOHN P. SUTHERLAND, M.D. HANS ZINSSER, M.D.
GEORGE R. MINOT, M.D. BENJAMIN WHITE, PH.D.
FRANK H. LAHEY, M.D. HENRY R. VIETS, M.D.
SHIELDS WARREN, M.D. ROBERT N. NYE, M.D.
GEORGE L. TOBEY, JR., M.D. ROBERT M. GREEN, M.D.
C. GUY LANE, M.D. CHARLES C. LUND, M.D.
WILLIAM A. ROGERS, M.D.

WALTER P. BOWERS, M.D., *Managing Editor*

ASSOCIATE EDITORS

GEORGE G. SMITH, M.D. WILLIAM B. BREED, M.D.
JOSEPH GARLAND, M.D.

THE NEW HAMPSHIRE MEDICAL SOCIETY
PUBLICATION COMMITTEE

D. E. SULLIVAN, M.D. H. H. AMSDEN, M.D.
R. H. MARCOTTE, M.D.

THE VERMONT STATE MEDICAL SOCIETY
PUBLICATION COMMITTEE

WILLIAM G. RICKER, M.D. C. F. DALTON, M.D.
E. A. STANLEY, M.D.

SUBSCRIPTION TERMS: *$6.00 per year in advance, postage paid for the United States, Canada $7.04 per year, $8.52 per year for all foreign countries belonging to the Postal Union.*

Material for early publication should be received not later than noon on Saturday. Orders for reprints must be sent to the Journal office, 8 The Fenway.

The Journal does not hold itself responsible for statements made by any contributor.

Communications should be addressed to The New England Journal of Medicine, 8 The Fenway, Boston, Mass.

AN AMERICAN TRAGEDY

THREE generations of family physicians named Huntington, residing on the east end of Long Island, New York, observed, in adults, an unusual condition of chorea and dementia. The disease was distinctly familial and the third generation of the Huntington family thought it important enough to write a description, which was published in an old Philadelphia journal, the *Medical and Surgical Reporter* for April 13, 1872. The same author, later, gave some recollections of this disease in the *Journal of Nervous and Mental Disease* for April, 1910.

It was reported that Huntington's grandfather first observed the disease in 1797; so it was known to at least one family of physicians for over one hundred years. It has been noted, moreover, that this disease in its hereditary characteristic goes back to the very first settlers coming from England to this country, and recently, Dr. Vessie* of Greenwich, Connecticut, has succeeded in tracing one group of sufferers to three men and their wives who came to this country in John Winthrop's fleet in 1630. These families, coming from Suffolk, England, are responsible for many descendants who have not only shown the characteristics of Huntington's chorea but, in the seventeenth century, were frequently persecuted for witchcraft. The details of Dr. Vessie's unusual investigation need not be entered into here; suffice it to say that he has been able to draw a direct line from one of the men, through twenty-two generations, to the present day. That women with this unusual malady should be considered as witches is reasonably understandable in view of their queer mentality and almost constant choreic movements. A goodly number were not only persecuted but hung. It took only a slight evidence, under certain circumstances, to try a witch and sentence her to the scaffold.

There have been many other investigations of the heredity of this disease by Hattie, Tilney, Jelliffe, Davenport and Muncie, and Hamilton, but none more carefully worked out than those presented by Dr. Vessie. He, moreover, calls attention to the connection between Huntington's chorea and witchcraft, an emphasis which has not previously been clearly put upon this disease. Although many of the witches, particularly those executed at Salem in 1692, were children showing the effects of "group hysteria"†, older persons, such as might be sufferers from Huntington's chorea, were frequently accused. Vessie's investigations are particularly important, therefore, not only to medicine but to the Colonial history of New England.

*Vessie, P. R. *Jour. Nervous & Mental Dis.* 76:553 (Dec.) 1932.

†Taylor, E. W. Some Medical Aspects of Witchcraft. "Problems in Personality," London: Kegan, Paul, Trench, Trubner & Co., 1925.

THE BOARD OF REGISTRATION IN MASSACHUSETTS AND IN OTHER NEW ENGLAND STATES

IN a democracy, the law represents, somewhat inaccurately, the general sentiment of the community and may be said to be the outgrowth of the life and experience of a given state or of the Nation. If one seeks for ground of appraisal of standards of excellence as therein expressed, one should compare and contrast them with the laws of adjacent and presumably similar communities, of like standards and intelligence and enlightenment. It is instructive to compare in this way, the medical practice act of Massachusetts with similar statutes of the other New England States, in so far as the attitude toward medical education is concerned.

The statute in Maine provides that the applicant for examination for registration shall

present to the board satisfactory proof that he is "a graduate of some reputable medical school or college in good standing, having power to confer degrees in medicine, and maintaining a standard of preliminary education and of medical instruction approved by the board". The other qualifications are similar to those of Massachusetts, twenty-one years of age, of good moral character, high school or equivalent preliminary education. In New Hampshire also the candidate must be twenty-one years of age, and of good moral character, but he must have completed two years of college work or its equivalent in his preliminary education, and must have "studied the treatment of human ailments not less than four school years of not less than nine months each in a medical school maintaining at that time a standard satisfactory to the board, and has graduated from such school". In Vermont, the statute says "a person twenty-one years of age and of good moral character who is a graduate of a legally chartered medical college or university having power to confer degrees in medicine and surgery, and such medical college or university being recognized as determined by the board". In Massachusetts, the statute provides that the candidate shall be "twenty-one or over, and of good moral character", possessing the "educational qualifications required for graduation from a public high school", and holding "the degree of doctor of medicine or its equivalent from a legally chartered medical school having the power to confer degrees in medicine, which gives a full four years' course of instruction of not less than thirty-six weeks in each year".

South of Massachusetts the law pertaining to good moral character and twenty-one years of age does not exist. In Rhode Island, the applicant shall present satisfactory evidence of graduation from a "medical school in good standing". Connecticut, not long ago, was the focus of attention in a "diploma mill scandal", and since that episode one of its boards of registration (the law provides for three) has been in a state of suspended animation. The legislative reaction was prompt but protracted, and the resulting enactments cannot be summarized briefly. The qualification of medical schools pertinent to this consideration, however, is that they must be "recognized as legal and reputable". Connecticut as recently as 1927 was made aware of the existence of diploma mills.

The contrast between the laws of the other New England States and the law of Massachusetts, where the statute does not detect the existence of a diploma mill or other unqualified medical school, is a matter of grave concern to the people of this Commonwealth. Why is it that Massachusetts lags so far behind these other states in this respect? If we are right, it matters little that others laugh at us. But if we are wrong, what?

A NEW ERA IN PSYCHIATRY

THE era is barely past when psychiatry was presented to medical students as an isolated specialty, almost totally unrelated to the other fields of medicine and one to be practised only in what were then termed "asylums" or in the commitment of patients to those unfortunately-named institutions. The subject matter was outlined in a few dry-as-dust lectures, with perhaps a clinic or two in a mental hospital for good measure.

It is hard to believe that in the course of only slightly over a decade a specialty has been able so to infiltrate medical thought and practice as has been the case with psychiatry. The World War was a large scale demonstration of the practical extra-institutional value of psychiatry,—in the selection of recruits and in the dealing with the various neurotic and psychotic manifestations incident to military service; for example, this specialty proved its ability as a conserver of human material and of the morale of the troops.

Since that time, and to a considerable extent because of its war-time service, psychiatry has undergone a remarkable extramural development. Its assistance to the Courts, notably in Massachusetts but to no mean extent throughout the country, need only be mentioned here. The very practical and valuable assistance which it has rendered to the schools has recently been the subject of an editorial and a leading article in this *Journal*.

The development of the Child Guidance movement, in which this Commonwealth has been one of the leaders, has been phenomenal, and has brought about a closer approachment between the specialties of pediatrics and psychiatry.

The preventive aspects of psychiatry have been widely emphasized by such organizations as the National Committee for Mental Hygiene and the Massachusetts Society for Mental Hygiene, and a large lay interest has developed in this field.

The emphasis of psychiatry in all these fields, as well, of course, as in the institutional treatment of mental disease, has increasingly been placed upon the view of the individual as a social unit,—that is, upon the *whole* patient. It is here especially that it has made its contribution to the general practitioner and to the specialist. Too often in the past the condition of the whole patient has been overlooked in the zeal to correct the abnormal condition of his kidneys, liver, or heart; were it not for this, the cults of today would very likely not have enjoyed the mushroom growth we observe about us. A recognition is becoming general among medical men that most cases, whether ostensibly mental cases or not, have their psychiatric aspects,—a fact that is equally true whether we are dealing with the person who is subconscious-

ly seeking escape from a discordant home situation by means of a neurosis, or with the patient who has developed morbid introspection or irritability over, for example, a gastric ulcer or a myocarditis.

The day is rapidly passing when the practitioner looks upon the neurotic patient as one to be passed on as soon as possible to some unsuspecting colleague or else to be merely "carried along". It is now generally recognized that the neurotic is amenable to treatment, and fully as deserving of therapy as any other patient. In many of the larger hospitals, a psychiatric service is being increasingly used by the other services of the institution, both in the out-patient departments and in the house. Indeed, psychopathic wards are being developed in some general hospitals and are in a very practical way bringing about a coöperation between psychiatry and general medicine.

Today psychiatry is being taught in the medical schools as an integral part of the curriculum, as an important field of medicine which has a close relationship to the other fields. It is, in fact, considered of sufficient importance to be named in the laws of the Commonwealth as one of the basic fields of medicine in which the Board of Registration shall examine applicants for registration as physicians.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

SMITH, GEORGE GILBERT. A.B., M.D. Harvard University Medical School 1908. F.A.C.S. Urologist, Massachusetts General Hospital and Palmer Memorial Hospital. Surgeon, Huntington Memorial Hospital. His subject is "The Treatment of Cancer of the Prostate." Page 57. Address: 6 Commonwealth Avenue, Boston.

CHRISTIAN, HENRY A. A.M., LL.D., Sc.D., M.D. Johns Hopkins University School of Medicine 1900. Hersey Professor of the Theory and Practice of Physic, Harvard University. Physician-in-Chief, Peter Bent Brigham Hospital. His subject is "The Pharmacology of Digitalis in Relation to the Therapy of Heart Disease." Page 66. Address: Peter Bent Brigham Hospital, Boston.

FREMONT-SMITH, MAURICE. M.D. Harvard University Medical School 1918. Assistant Physician, Massachusetts General Hospital. His subject is "Relationships Between Emotional States and Organic Disease." Page 69. Address: 12 Hereford Street, Boston.

BUTLER, ALLAN M. Litt.B., M.D. Harvard University Medical School 1926. Assistant, Rockefeller Institute 1926-1928. Fellow in Pediatrics, Harvard University Medical School 1929. Tutor in Department of Biochemical Sciences, Harvard University 1928-1929. Instructor in Pediatrics, Harvard University Medical School. Clinical Assistant Physician to the Children's and Infants' Hospitals, Boston. His subject is "Considerations on Protein and Salt Therapy in the Various Types of Bright's Disease." Page 71. Address: Children's Hospital, Boston.

ROGERS, EDWARD J. B.S., M.D. Medical College State of South Carolina 1908 and Columbia University College of Physicians and Surgeons 1912. Resident Physician, Loomis Sanatorium Annex 1908-1911. Superintendent and Medical Director, Vermont Sanatorium, Pittsford since 1913. Medical Director, Caverly Preventorium, Pittsford since 1922. Medical Director, Washington County Sanatorium, Barre, Vermont since 1921. Member, State Board of Health 1921 to 1931. His subject is "Pneumothorax Treatment in Tuberculosis." Page 78. Address: Pittsford, Vermont.

PARSONS, RUTH I. C.P.H. and TURNER, C. E., Dr.P.H. For further information see This Week's Issue, page 47, issue of January 5, 1933.

MASSACHUSETTS LEGISLATIVE NOTES

The following bills, of interest to the medical profession, are before the Massachusetts Legislature:

H. 121 seeks to require each city or town to provide for the treatment, either in a hospital or as out-patients, or indigent persons suffering from gonorrhea or syphilis.

H. 122 seeks to forbid discrimination against the treatment of venereal diseases in the out-patient department of any general hospital supported by taxation in any city or town where special hospitals, other than hospitals connected with penal institutions, are not provided for the treatment of those diseases at public expense; but any such hospital may establish a separate ward for the treatment of venereal diseases.

H. 123, to amend the law with respect to the divulging of hospital, dispensary, laboratory or morbidity reports and records pertaining to gonorrhea or syphilis, proposes that that law shall not prevent a physician from informing the husband or wife of a patient having gonorrhea or syphilis of the patient's infection when in the opinion of the physician that information is necessary to protect the patient's spouse.

H. 119 relative to polluted shellfish which provides for the elimination of Chapter three hundred and fifty-seven of the acts of nineteen hundred and thirty-one.

H. 118 relative to Subsidies to Cities and Towns for Pulmonary Tuberculosis Cases.

H. 154 the report of the Director of Accounts and Commissioner of Public Health relative to charges for support of inmates in State Sanatoria and County Tuberculosis Hospitals.

H. 117:

1. *Relative to Subsidies to Cities and Towns for Pulmonary Tuberculosis Cases.*

At present the State pays $5 a week to cities and towns for every case of tuberculosis in an institution approved by the State Department of Public Health. We now ask that such payments should also depend upon an adequate tuberculosis prevention program in the city or town receiving this subsidy.

Under this bill the money which the Commonwealth now pays would be spent more effectively. The Department of Public Health would secure, in addition to the approval of the committee as required by the act, the advice and assistance of a group of impartial men familiar with case finding, treatment and after care of tuberculosis in regard to minimum standards with which cities and towns would have to comply in order to secure the subsidy. Standards would be entirely "reasonable," time would be allowed, and all possible advice and assistance would be given to local communities in developing an adequate tuberculosis service. The object of the bill is that money spent should be spent more effectively. Its primary purpose is not to control expenditures but to control tuberculosis.

Massachusetts now has more adequate tuberculosis hospital facilities per unit of population than any other State in the Union. With the recent opening of the Middlesex County Hospital and of the Worcester County Hospital there will be 4,200 beds in city, county, State and private hospitals for pulmonary tuberculosis, while in 1930 there were 2,423 pulmonary deaths. This gives a ratio of 1.7 beds for every annual death from pulmonary tuberculosis. This represents an annual maintenace cost of at least $4,000,000, without any consideration of the many thousands in initial construction cost for each bed. Add to all this the cost of private medical, clinic, and nursing care, as well as lost employment, public and private dependency and poverty, and we see that in Massachusetts the annual cost of tuberculosis is in figures which we still associate with Liberty Loans and other emergencies.

But the worst feature is that these lavish hospital resources are being grossly misused. Less than 20 per cent of the patients enter these hospitals in an early and favorable stage of the disease, while as a reasonable minimum 60 per cent should so enter. What does this mean? First, the chance of life and return to independent gainful employment is enormously reduced. Second, the duration of stay in hospitals and therefore the cost per patient, is greatly increased. Third, and perhaps most important, the number of patients with positive sputum spreading the disease for long periods before detection and subsequent hospitalization, is vastly more widespread than it should be. Thus, through infection of children, fellow workers, casual contacts on street and street cars, at meetings, concerts, crowding of all sorts, perhaps through our most intimate friends, especially through close contact in the homes, tuberculosis is striving successfully for immortality.

Adequate resources for early case finding and competent follow-up of the cases leaving the hospitals, that the shockingly costly burden of "repeaters" may be diminished, are within the power of every city and town in the State today. Yet still we have communities that report more deaths than cases of tuberculosis (think of it!); others that almost never hospitalize until death is imminent and spread has been accomplished; many more with no thought of offering decent supervision to the ex-hospital patient to prevent or early to detect relapse. In some places there is not even wholesome dissatisfaction with these conditions. Surely, if they cannot be improved we can stop the irony of paying State moneys to perpetuate such futility.

2. *Relative to Polluted Shellfish.*

At present any one delivering polluted shellfish can avoid conviction by claiming that such shellfish came from areas not designated by the Department of Public Health as contaminated, or that such shellfish had passed a shellfish treatment plant. Unless we have been present at the digging, and followed them all the way since, we cannot effectively disprove this. Thus protection of the public is nullified.

Our experience under this act is even worse than we suspected, and we therefore ask that it be repealed in order that the public may be protected from the menace of consuming polluted shellfish.

MISCELLANY

MEDICAL PERSONNEL AND FACILITIES INADEQUATE TO MEET REAL NEEDS OF UNITED STATES PEOPLE, EXPERTS FIND*

Washington, D. C. — Medical care in the United States is faced with a serious dilemma: on the one hand, present medical personnel and facilities are inadequate to meet the real needs of all the people; on the other hand, until the people first have been educated to demand good medical care and until more satisfactory arrangements have been made for paying the costs of such care, it would be unwise to increase the personnel and facilities because such an increase would result merely in additional unemployment among medical practitioners and an accumulation of unused equipment. This

*Authorized for release by the Committee on the Costs of Medical Care, 910 Seventeenth Street, N. W., Washington, D. C. Dr. Ray Lyman Wilbur, Chairman; Dr. Harry H. Moore, Director.

situation was revealed in the latest report of the Committee on the Costs of Medical Care.

This study of "The Fundamentals of Good Medical Care," by Roger I. Lee, M.D., and Lewis Webster Jones, Ph.D., published by the University of Chicago Press, is the twenty-second report completed by the Committee on the Costs of Medical Care, which on November 29, 1932, at a meeting in New York City, issued its Final Report with recommendations based on its five-year study of the problem of providing "adequate, scientific medical service to all the people, rich and poor, at a cost which can be reasonably met by them".

Intense interest has been aroused both in medical circles and among the lay public as to the final recommendations of the Committee. The Committee was a non-governmental organization composed of physicians, dentists, public health officers, economists, and representatives of various institutions and of the general public.

REAL NEEDS CONTRASTED WITH AVAILABLE MEDICAL CARE

The report estimates that approximately 135 physicians are necessary to meet the present real needs of an average population group of 100,000, whereas there were actually only 126 physicians per 100,000 inhabitants in the United States in 1929.

The estimated real need for dentists is between 99 and 179 per 100,000 people, whereas in 1928 there were only 56 actually available. (The variation in the estimate, "99 and 179," is dependent upon the extent to which dental hygienists and dental technicians are used.)

The estimated real need for hospital beds of all kinds per 100,000 population is 1,158, whereas in 1930 there were 730 per 100,000 such beds available.

These figures were ascertained after a careful survey of the present extent of diseases and disabilities among the people and the formulation of detailed estimates of the amount of service needed to care for these conditions. In estimating the services needed, the authors consulted scores of prominent internists, surgeons, obstetricians and other specialists, and many general practitioners.

The report makes no attempt to contrast real need with the present demand for medical care. Previous publications of the Committee and a report on the medical care received by 9,000 families in the United States indicate that the present effective demand for medical service fails to utilize the facilities of agencies now available. "Since no unified system designed to provide service in accordance with the ascertained need has ever been set up, the present demand bears no necessary relation to the real need for medical care," according to the authors.

The provision of adequate medical care must therefore wait upon a practical solution of the problems of economic organization, in which the questions of cost and the means of payment are paramount. It involves also the solution of difficult problems of technical organization to assure not only quantitative sufficiency, but above all that quality of service which can be realized only by the maintenance of the traditionally high standards of the medical profession.

GOOD MEDICAL CARE DEFINED

The coördination of all types of medical care and the application of modern, scientific medicine to the needs of all the people are fundamental in the provision of good medical care, the authors of the report state.

The "articles of faith," upon which the concept of good medical care as used in the report is based, are listed by the authors under the following headings:

1. *Good medical care is limited to the practice of rational medicine based on medical science.*

There is no place in modern medicine for the quack, the cultist, or the magician; any system of prevention, diagnosis, or therapy which is not founded on rational observation and deduction has a "hit or miss" character incompatible with good medical practice.

2. *Good medical care emphasizes prevention.*

Preventive medicine is by no means confined to "public health" activities. The idea of prevention must pervade and inspire all branches of medicine. Prevention, diagnosis and treatment are inseparable aspects of the science and art of medicine.

3. *Good medical care requires intelligent coöperation between the lay public and the practitioners of scientific medicine.*

The coöperation of the patient is fully as important as the efficiency of the practitioner and the availability of his services. Often the best of doctors can do little for a patient who does not follow instructions.

4. *Good medical care treats the individual as a whole.*

All the factors which concern his health—mental and emotional as well as physiological — must be weighted in diagnosis, prevention and treatment.

5. *Good medical care maintains a close and continuing relation between physician and patient.*

Because of the complex nature of a human being and the intricate relationship between body and mind, and between the parts and the whole, a long familiarity with the patient's personality and habits is a first essential of good medical care. No amount of technical skill, no combination of mechanical and laboratory devices, is so useful in the diagnosis of many conditions as a personal knowledge of the patient's history, family situation, and general mental and physical idiosyncrasies.

6. *Good medical care is coördinated with social welfare work.*

The value of medical care among the poorer economic classes is vitiated if the patient is sent back after a course of treatment into the same surroundings which gave rise to his ailment. While medicine cannot cure unemployment or abolish slums, much can be done by coöperation with the

social agencies to improve the level of health among the poorer members of society.

7. *Good medical care coördinates all types of medical services.*

Good medical care requires that a proper balance and coördination exist among all the various agencies and different types of institutions and organizations through which medical services are provided.

8. *Good medical care implies the application of all the necessary services of modern, scientific medicine to the needs of all the people.*

Medicine does not adequately fulfill its functions until the same perfection of technique is within the reach of all individuals.

CORRESPONDENCE

LACK OF AGREEMENT WITH THE LETTER OF DR. HAIGH

December 29, 1932.

Editor,
New England Journal of Medicine,
Dear Sir:

I read with interest the communication from Dr. Haigh in your last week's issue. I also read the report of the Committee of Medical Costs and the editorial written presumably by Dr. Fishbein in the *Journal of the American Medical Association.*

I was somewhat shocked at the attack on the officers of our parent society by Dr. Haigh. I am afraid the good doctor has let his enthusiasm for a regulation of the medical profession get the best of him.

It does seem to me that Dr. Fishbein and his associates have labored earnestly, faithfully and successfully for the betterment of the profession as a whole and to claim that they sell their services unethically as writers, etc., is really to say the least unfair without any data to back up the charge.

I beg leave here to quote from the editorial in the *Journal of the American Medical Association:*

"There is the question of the right of the American citizen to pick his own doctor and his own hospital, to pay his own bills with his own money, to be responsible to a doctor who is responsible to him. Let the big business men, who would reorganize medical practice, the efficiency engineers, who would make doctors the cogs of their government machines, give a little of their sixty-horse power brains to a realization of the fact that Americans prefer to be human beings."

According to Dr. Wilbur, there is a tremendous sentiment in favor of a regulation of the medical profession in this country, as outlined by Dr. Wilbur. I have a large practice in a typical American community: I have yet to hear of any complaint of the present status of the practice of medicine or any desire to change. I know that patients object to going to state or city institutions, or to be in any way further regulated by the Government, or by anybody else.

People are sick and tired of being told what is good for them in medicine, religion and politics. The same elements who are trying to reform the medical profession succeeded in reforming (?) the habits of the people by pushing through the 18th Amendment. We know what a mess the reformers accomplished when they put through that disastrous experiment.

The doctors are hit hard by the depression, but they are doing their work and treating their patients decently.

The depression over, physicians can look back with pleasure at the work done by them during this time and the general practitioner will be more firmly entrenched than ever in the people's esteem, and without the general practitioner the plans of Dr. Wilbur and his associates will fall to naught even if the people would stand for it, which I am sure they won't.

I would respectfully say to Dr. Haigh that the officers in Chicago have not proved themselves dogmatic or domineering, and that I believe that they are striving to help the profession as a whole and that Dr. Fishbein is deserving of the utmost credit for condemning and exposing this most improper solution of medical problems.

From my contact with physicians who have discussed the subject, I feel that the majority of physicians are back of the editorial in the *Journal of the American Medical Association.*

Sincerely,

CHARLES MALONE, M.D.

46 St. John Street, Jamaica Plain, Mass.

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

535 North Dearborn Street, Chicago, Ill.,
December 31, 1932.

Managing Editor,
The *New England Journal of Medicine,*

In addition to the articles enumerated in our letter of November 26 the following have been accepted:

Maltine Company
Maltine with Mineral Oil and Cascara Sagrada

Yours very truly,

PAUL NICHOLAS LEECH, *Secretary,*
Council on Pharmacy and Chemistry.

RECENT DEATHS

KLINE—GEORGE MILTON KLINE, M.D., died January 5, 1933, at his home in Boston after an illness of several weeks.

Dr. Kline was born in Pittsburgh, Pennsylvania, on March 6, 1878, the son of Daniel Zimmerman and Eleanor (Bitler) Kline. The family moved to Grand Rapids, Michigan, where Dr. Kline ac-

quired his early education. He graduated in medicine from the University of Michigan Medical School in 1901 and began his professional career in the Worcester State Hospital, under Dr. Adolf Meyer, where he served as assistant physician for two years. This was followed by four years at the Iowa State Hospital and six at the Psychopathic Hospital of Michigan at Ann Arbor. Returning to Massachusetts in 1912 he held the position of Superintendent of the Danvers State Hospital until 1916 when he was appointed by Governor McCall as Commissioner of the Massachusetts Department of Mental Diseases.

Under Dr. Kline the department has grown to be one of the important demonstrations of advanced treatment of mental diseases. He was influential in securing many changes in the methods employed in dealing with mental diseases. He attracted men of ability to state service and created a strong coöperative spirit among his associates.

Dr. Kline married Miss Ethel A. Fry, June 23, 1906, who, with two daughters, survives him.

He joined the Massachusetts Medical Society in 1914 and held membership in the American Medical Association, the American Psychiatric Association, the Association for Research in Nervous and Mental Diseases and many other similar organizations in this and foreign countries.

LANPHER—Howard Arthur Lanpher, M.D., died November 7, 1932, in Des Moines, Iowa, aged 49 years, 9 months and 14 days.

He was born in 1883, graduated in medicine from Tufts College Medical School in 1907 and served with the State Department of Public Health, Iowa, for some time.

Dr. Lanpher joined the Massachusetts Medical Society in 1907 and was a member at the time of his death.

NOTICES

MASSACHUSETTS DEPARTMENT OF EDUCATION

University Extension Course

The Massachusetts Department of Education offers a course of eight lectures on How to Keep Healthy (Personal Hygiene from Infancy to Old Age).

Class begins: Monday, January 16, 1933, 7:30 P.M.

Place of meeting: Harvard Hall, Harvard University, Cambridge.

Eight lectures; one semester hour.

Charge: $3 for auditors; $5 for credit students; textbook extra.

Course leader: Dr. Nathan H. Garrick, Director of Health Service, Boston University.

The dates, subjects, and lecturers are as follows:

January 16—Building for Efficiency. (Emphasis on recreation.) Dr. Frederick Rand Rogers, Dean, Department of Physical Education and Student Health, Boston University.

January 23—The Body as a Medium for Expression. Mr. Carl L. Schrader, Supervisor of Physical Education, Massachusetts Department of Education.

January 30—Cause and Prevention of Heart and Blood Diseases. Dr. William H. Robey, Clinical Physician of Medicine, Emeritus, Harvard Medical School.

February 6—Chronic Disease: Rheumatic Group. Dr. Loring T. Swaim, Chief of the Orthopedic Staff, Robert Brigham Hospital.

February 13—Diseases We Don't Talk About. Dr. Nels A. Nelson, Assistant Director, Division of Communicable Disease, Massachusetts Department of Public Health.

February 27—Community Health. (Including sanitation.) Dr. Wilson G. Smillie, Harvard School of Public Health.

March 6—The Problems of Chronic Disease and What We Can Do About It. Dr. Herbert L. Lombard, Director, Division of Adult Hygiene, Massachusetts Department of Public Health.

March 13—Public Health. Dr. George H. Bigelow, Commissioner, Massachusetts Department of Public Health.

Persons may take this course either as auditors, or as credit students. Certificates will be awarded to those who satisfactorily complete the required work of the course. The course is of college grade and has a credit evaluation of one semester hour. Enrollments will be accepted at the first meeting.

RADIO HEALTH MESSAGES

January-February-March, 1933

Sponsored by the Public Education Committee of the Massachusetts Medical Society and the Massachusetts Department of Public Health.

Courtesy WBZ. Tuesdays, 4:15 P.M.

January
- 17 Insurance Against Diphtheria
- 24 What Is New in Infant Feeding?
- 31 Cancer

February
- 7 The Heart
- 14 Your Title to a Job
- 21 Why a Health Department?
- 28 Effects of Fatigue

March
- 7 Vacation Health
- 14 The Use and Abuse of Serums and Vaccines
- 21 Can We Prevent Diabetes?
- 28 Hobbies and Health

State House Broadcast

Sponsored by the Massachusetts Department of Public Health.

Courtesy WEEI. Fridays, 12:45 P.M.

Health Subjects of Public Interest discussed by the Division Directors of the Department.

RADIO HEALTH FORUM

Queries from the public are answered under the sponsorship of the Department of Public Health.

Courtesy WEEI. Fridays, 4:50 P.M.

Questions on Health and Prevention of Disease may be sent to Radio Health Forum, State Department of Public Health, State House, Boston.

CLINICS IN MEDICINE AT PETER BENT BRIGHAM HOSPITAL

On Thursdays at 3:30 P.M. in the Amphitheatre of the Peter Bent Brigham Hospital Dr. Henry A. Christian, Hersey Professor of the Theory and Practice of Physic, Harvard, and Physician-in-Chief, Peter Bent Brigham Hospital, will give a series of clinics which members of the medical profession are cordially invited to attend. The next clinic will be given on January 19.

Physicians and medical students are also invited to attend ward rounds of the Medical Staff of the Peter Bent Brigham Hospital held from 10-12 o'clock on Saturdays, as well as a clinical-pathological demonstration immediately following these rounds.

HARVARD UNIVERSITY

FREE PUBLIC LECTURES ON MEDICAL SUBJECTS

The Faculty of Medicine of Harvard University offers a course of free public lectures on medical subjects, to be given at the Medical School, Longwood Avenue, Boston, on Sunday afternoons, beginning January 8 and ending March 26, 1933. The lectures will begin at four o'clock and the doors will be closed at five minutes past the hour. No tickets are required.

SUNDAY AFTERNOONS AT FOUR O'CLOCK

January 15—Dr. W. B. Castle: Anemia.

January 22—Dr. G. H. Bigelow: The Depression and Health.

January 29—Dr. W. B. Lancaster: Sparing the Eyes.

February 5—Dr. G. P. Grabfield: Rheumatism.

February 12—Dr. G. H. Wright: Color Changes in the Mouth and Teeth: an Aid in Diagnosis of Systemic Disease.

February 19—Dr. W. H. Robey: Let the Head Govern the Heart.

February 26—Dr. H. R. Viets: Nerve, Nerves, and Nervousness.

March 5—Dr. E. L. Oliver: The Care of the Skin and Scalp.

March 12—Dr. Shields Warren: Cancer and Radiation Therapy.

March 19—Dr. Randall Clifford: The Tuberculosis Problem Today.

March 26—Dr. W. G. Smillie: A Discussion of the Common Cold.

REPORTS AND NOTICES OF MEETINGS

MASSACHUSETTS GENERAL HOSPITAL

STAFF CLINICAL MEETING

The regular clinical meeting of the staff of the Massachusetts General Hospital was held in the Moseley amphitheatre on December 8. Dr. W. J. Mixter presided.

A medical case was presented by Dr. Richard Hawkes. A 43 year old housewife entered the hospital complaining of pains of six years' duration in her joints. She had had rheumatic fever at the age of 14 with involvement of the ankles. At about the age of 25 she suffered for five years from rheumatism in the left shoulder. Nine years before entry a panhysterectomy was done for menorrhagia. Six years ago her metatarsophalangeal joints became extremely tender, swollen and shining at night. Five years before entry her tonsils were removed with no relief. Her fingers became painful three years ago, and her knees one year ago. Four months before entry she had severe right upper quadrant pain radiating to the right shoulder. This attack lasted three days; a similar one occurred two months later. Two months ago her knees, fingers and right hip again became painful. In addition, she had nocturia, three times, for the past four years.

Physical examination showed a nodule three cm. in diameter in the thyroid, limited movement of the knees and swollen metatarsophalangeal joints. The urine had a specific gravity of 1.010 to 1.018. The sediment was loaded with white cells at admission, but gradually cleared. Stools were weakly positive for guaiac. The red count was 3.5, the white cells varied from 6.0 to 9.0, the hemoglobin was 60. A smear showed a normal differential and a hypochromic anemia. Blood studies revealed normal calcium, phosphorous, creatinine, and cholesterol values. The NPN was 56 at entry, diminishing to 40. The uric acid varied from 7.8 to 9.1 mg. per cent. A gastric analysis showed total achlorhydria. The BMR varied from —25 to —37. A gonococcus complement fixation test was negative. Intravenous PSP produced only five per cent output in 15 minutes. A cystoscopy and pyelograms were negative. X-rays showed proliferative changes about the knees and metatarsophalangeal joints, many stones in the gall bladder, essentially normal chest and sinuses. The case is considered to be one of gout. Under treatment her joint symptoms have disappeared.

Dr. Jacobsen, in discussion of the case, stated that the diagnosis, suggested by the high blood uric acid, was confirmed by metabolic studies which showed a typical low endogenous output of uric acid in the urine. It is possible that raising the BMR with thyroid may increase the uric acid excretion.

Dr. George G. Smith discussed "The Operability of Prostatic Disease." He observed that the op-

erability of prostate cases has greatly increased in the last two decades because of better preoperative care, more satisfactory anesthesia, and improved operative technique. Large series with a very low mortality have been reported by Hugh Young, employing the perineal route, and by Bugbee, using the two-stage operation. The chief dangers arise from defects either in the cardiac or renal systems.

He reported two cases in which death followed prostatectomy because of an underlying, unsuspected renal impairment. The first, a man of 77, had an attack of cardiac decompensation followed by a severe hemorrhage from the posterior urethra six years later. Meanwhile a four-ounce residual urine had been reduced to two. The PSP test showed 15 per cent excretion, the NPN was 49. Suprapubic drainage was done. Twelve days later the PSP was 45, but the NPN was 54. It was decided to do a quick second stage prostatectomy. On the day following operation, the blood pressure rose suddenly, and the patient died. Autopsy showed a heart of normal size with some endocardial sclerosis. The kidneys were small and granular. The cortex was markedly and irregularly thinned. Microscopically, they showed sclerosis, and hyalinization of the glomeruli and arterioles. The chronic vascular nephritis was an important factor contributing to the patient's death.

The second case was that of a man of 62 who entered with a distended bladder. The NPN was 110. Suprapubic drainage was established and continued for four months, when the NPN had dropped to 75. At this time a medical consultant found a moderately enlarged heart and a negative electrocardiogram. He believed the patient was in a satisfactory condition for operation. Prostatectomy was done. The patient lived for four days thereafter with a progressive rise in pulse rate. Digitalis produced no result. The death appeared to be due to a toxemia, rather than to cardiac failure. No autopsy was obtained. Dr. Smith concluded that if the NPN fails to fall with adequate drainage of the bladder, the case is not suitable for operation.

Dr. Fletcher H. Colby spoke on "Hydronephrosis." He presented several unusual cases which developed hydronephrosis because of some lesion. In one, a bilateral hydronephrosis resulted from ureteral obstruction from an appendix abscess, and disappeared one month after drainage of the abscess. A case of carcinoma of the bladder led to hydronephrosis first on the right and then on the left from partial occlusion of the ureteral orifices. Congenital megalo-ureters, perhaps due to a malfunctioning sympathetic system, may cause hydronephrosis. More common causes are aberrant vessels at the ureteropelvic junctions, kinks of the ureter, silent ureteral stones, and anomalous ureteral valves. Obstruction of the ureters is much more important than that of the urethra in the production of hydronephrosis, because the bladder acts as a buffer in the latter case.

Cecil has noted that 30 per cent of a series of cases of hydronephrosis were operated on before the correct diagnosis had been established. The occurrence of gastro-intestinal symptoms is common. Dr. Colby illustrated this statement by two cases.

The first was that of a truck driver, 34 years of age. For ten years he had had attacks of vomiting. They gradually increased in frequency, so that in the past two years these attacks recurred every day. They frequently occurred at night, and were preceded by abdominal pain, nausea and backache. They were relieved somewhat by soda, and by a milk diet. An appendectomy had been done to no avail. Examination showed a firm round mass in the right upper quadrant. The urine was negative except for an occasional white cell. A barium meal showed the duodenum displaced to the left and a large 24-hour residue in the stomach. The Graham test showed no filling of the gall bladder. A pyelogram revealed marked dilatation of the right kidney pelvis. Urine cultures were negative. At operation a vessel was found crossing the ureteropelvic junction. Nephrectomy was done with immediate and complete relief of the symptoms.

The second case was a 40 year old nurse who had intermittent attacks of nausea and vomiting for two years. During this time she had much gas and chronic constipation. Vomiting had been frequent and projectile. The urine contained an occasional white cell. No abnormality was shown by a barium meal. Pyelograms showed a dilated right pelvis with a kink in the upper ureter. A small vessel crossing the ureteropelvic junction was divided, and the kidney suspended. The patient had no complaints six years later.

The kidney can recover from hydronephrosis if the damage is not too severe. Permanent nephrostomy was successful in one of his cases in which the only remaining kidney showed great hydronephrosis.

Dr. Channing S. Swan discussed "Perinephritic Abscess." He summarized the 114 cases which have been treated in the Massachusetts General Hospital from the years 1913 to 1932. They may be classified in two groups — arising either primarily in the perirenal fat, or by extension from the kidney or near-by structures. There is clinical and experimental evidence for both types, although there is probably a renal origin for most cases, since the perirenal fat should have no special predilection for infections.

Cultures were obtained in 53 cases. Thirty were due to Staphylococcus aureus, nine to Staphylococcus (unclassified), six to Streptococcus, five to B. coli, two to the tubercle bacillus. The remainder were mixed infections. The most common antecedent lesion was furunculosis. Trauma, renal disease, upper respiratory infection and tuberculosis were also common.

One hundred and two males and 12 females were affected. It is predominantly a disease of young adult life and the abscesses occur about equally on both sides.

The clinical picture is often puzzling. Usually the patient gives a history of a fortnight's disability, but it may be much longer. Pain in the back, fever, and tenderness are the important signs. Genito-urinary symptoms occur in less than a third of the patients; frequency is the most important. They may follow gastro-intestinal symptoms.

The urinary sediment was negative in nine cases, showed a few white cells in 50, and was loaded with them in the remainder. The white blood cell count, usually 20,000, varied from 11,000 to 40,000. Cystoscopies were done in 29, but were positive in only eight cases.

The x-ray was of no help in most cases. Positive signs are curvature of the spine away from the involved side, and obscuring of the outer side of the psoas muscle. Frequently a high diaphragm will be shown on the affected side.

Incision and drainage is usually sufficient treatment. Extension may occur in all directions. In this series there were ten deaths, of which pyelonephritis with peritonitis or septicemia accounted for six.

Dr. J. D. Barney spoke on "Some Preliminary Observations on Prostatic Resection." Alcock has reported a series of cases in which the mortality was 10%, and the time of hospitalization 13 days. The Mayo Clinic reports a mortality of 2% in 175 cases.

In this hospital 42 cases have been treated by resection, of which seven died. Six autopsies were obtained. Pulmonary emboli accounted for two deaths, uremia, pyelonephritis, urinary sepsis, and septicemia for the others. In one case the cause of death was not found. Cases of carcinoma had a much higher mortality than the benign group.

The patients averaged a residual urine of five ounces on admission. The average preoperative stay was 11 days. Before resection, 14 of the cases had vasectomies.

The preoperative diagnosis was carcinoma in 14, adenoma in 27, and fibrosis in one. At operation the average amount of tissue removed was 1.34 grams. The pathologic reports were carcinoma in nine cases, adenoma in 17. In the others the tissue was so burned by coagulation that no diagnosis could be made.

About one hour is the time required for operation. Afterwards, drainage was required for 11 days, on the average, and bed rest for 12.5. They were discharged about three days later, with an average residual of two ounces.

After resection two had prostatectomy, and two had cystotomy for severe hemorrhage. Scrotal or periurethral abscesses developed in five.

Fourteen cases have been followed. Three are dead, two of carcinoma. Two are hospitalized with complications, one has tabes. The general condition of the remainder is good after an average interval of eight months.

HARVARD MEDICAL SOCIETY

The Harvard Medical Society held its stated meeting on Tuesday evening, December 13, at 8:15 P.M., in the amphitheater of the Peter Bent Brigham Hospital. Dr. S. A. Levine presided. The meeting was opened with a presentation of cases.

The first case was that of a 12 year old boy with a complaint of recurrent vomiting over a period of several years. The patient recalls that he has always vomited easily. In 1927 he was admitted to the Children's Hospital with a complaint of vomiting without nausea, after eating. At this time a diagnosis of gastric neurosis was made, and the patient sent to the Wellesley Convalescent Home. He returned to the Children's Hospital after failure to improve, and thence was sent back to Wellesley. At this time he admitted swallowing a coin six months previously. X-ray studies revealed a coin in the esophagus at the juncture of the middle and lower thirds, and this was removed with the esophagoscope. A stricture was also found at this point, and bougies passed. The patient has returned at intervals for dilatation of the esophagus and entered the Peter Bent Brigham Hospital because he had passed the age limit of the Children's Hospital. At the present entry, bougies up to No. 37 French scale have been passed. The patient has gained seven pounds since admission one month ago.

Dr. Elliott C. Cutler, in discussing this case, stated that the question of diagnosis lay between intra-esophageal stricture and congenital atresia. He is of the opinion that the latter is the correct diagnosis for, (1) the stricture appears just a little below the usual level of a broncho-esophageal fistula, (2) the esophagus shows normal mucous membrane, (3) the funnel shape of the esophagus leading to the stricture is somewhat different from that seen in traumatic cases.

The second case was that of a 16 year old boy, who first entered the hospital on May 19, 1932, with the complaint of general eruptions over his body, epigastric pain, vomiting of blood, and diarrhea of two weeks' duration. Physical examination revealed eruptions that were both confluent and discrete, of a maculopapular type. There were numerous ecchymotic areas on his arms and legs, and one petechia noted in the right fundus. The vomitus and stools gave strongly positive reactions with benzidine. The blood picture was essentially normal save for a slight secondary anemia. The clotting and bleeding times were normal. Eight transfusions were given over the course of one and one-half months. The patient left the hospital and spent the summer out-of-doors, having regained all lost weight and remaining free from any bleeding. He reëntered the hospital on December 12 with a complaint of fullness under the xyphoid process, and vomiting of solids. He also had a

rash over his ankles similar to that seen on his first admission. This patient shows a stricture of the esophagus at the junction of the middle and lower thirds with a crater at the base.

Dr. Henry A. Christian stated that this was a typical case of simple purpura, the cause of which was unknown. The nausea and difficulty in feeding were typical, as were also the intestinal hemorrhages. The stricture of the esophagus was not present at the time of his first admission. The question now is as to whether it is an incidental finding or bears some causal relationship to the purpura.

Dr. E. A. Bartram read a paper entitled "Digitalis as a Diuretic." From the literature the speaker cited laboratory experiments and clinical observations, which were much too controversial to give an affirmative answer to the question of whether digitalis acts as a diuretic.

Last year Dr. Bartram studied various diuretics in dogs by injecting them in increasing amounts into one renal artery. When very small doses were administered, only the kidney supplied by the artery injected would show increased output of urine. Later, as the dose was enlarged, the other kidney would begin to increase its activity, and with still larger doses the first kidney would gradually cease its secretion. Similar experiments were tried with digitalis and similar results followed, indicating that digitalis is a diuretic. Just what the mechanism may be is not known. Investigators have shown that digitalis constricts the splanchnic vessels, and in small doses dilates the kidney vessels. In increased doses digitalis produces vasoconstriction of the renal vessels. The constriction of the splanchnics may lead to increased flow through the dilated renal vessels and thus explain the diuresis.

Dr. Henry A. Christian discussed the subject of "Digitalis in the Treatment of Cardiac Disturbances other than Cardiac Decompensation." In the early days of digitalis therapy the practitioners used this drug as a tonic. Following this and down to recent times it was taught that digitalis has its only therapeutic value in cardiac decompensation. To emphasize this Dr. Christian referred to the current textbooks of White, McCrae's Osler, Cecil and Musser in which digitalis is not advocated in cases with good compensation. Dr. Christian stated that he has come to the conclusion that digitalis has a definite place in helping to inhibit cardiac hypertrophy and retard the aging processes of the myocardium.

The speaker first outlined his interpretation of cardiac hypertrophy. Contrary to the general opinion, this is not a beneficent process, but is injurious to heart efficiency. Once hypertrophy commences, the heart is on the way to failure. This idea is quite different from that which applies to skeletal muscle, in which hypertrophy fills a need for greater work. In skeletal muscle, size usually determines the reserve and strength of the muscle. The difference between skeletal and heart muscle is that the latter surrounds a cavity which it empties. Physiological laws state that stretching a muscle up to a certain point leads to increased strength of contraction. It is this law which enables the heart in normal people to respond to a demand for increased activity. When this demand is constant the heart hypertrophies, the cavity enlarges, and the muscle fibers are permanently stretched beyond the physiological extreme of increased efficiency. Hence diminishing returns follow successive dilatation and hypertrophy, and whereas the mechanism of hypertrophy may increase cardiac output, it does so at the cost of decreased reserve.

Clinically cardiac enlargement is the beginning of failure. Except in myxedema, the enlarged heart practically never decreases in size.

If cardiac hypertrophy is undesirable and may be considered as a step toward decompensation, it is wise to use therapeutics that prevent this process as much as possible. In this regard digitalis is of value.

There is some variation of opinion as to what constitutes a tonic dose of digitalis, but it is best to stay short of a toxic dose. Dr. Christian advocates beginning doses of 0.1 Gm. twice daily over a period of two weeks. If this produces no symptoms of toxicity, the dose may be increased to 0.15 Gm. twice daily for a similar length of time. This may give some toxic symptoms, thereby indicating that the optimal dose lies somewhere between the two figures. If toxic symptoms appear at any time during this period of testing for the optimal dosage, the dose should be reduced at once.

The reasons for thinking that digitalis is of value before cardiac decompensation sets in are as follows: (1) When a patient comes to a hospital in a state of decompensation, and rest and digitalis bring the patient back to compensation, a cessation of digitalis often results after a short time in redecompensation, (2) patients are able to lengthen the periods between decompensation with digitalis and also can work more efficiently if taking digitalis during the interim. Reasoning from these facts, we begin at the other end, and before the patient has any signs of decompensation we can postpone the date at which this episode begins by giving digitalis.

In addition to clinical evidence, there are many laboratory data to support the contention that digitalis is an efficient cardiac "tonic". In the early days of digitalis therapy it was taught that this drug produces cardiac hypertrophy. If two groups of rabbits are taken, and to one is fed digitalis and to the other none, autopsy reveals smaller hearts in those animals receiving the drug. More recently aortic insufficiency has been produced in animals, and these animals submitted to similar experiments. As before, the smaller hearts are found in the animals receiving digitalis. By isolating the hearts of animals with experimental aortic insufficiency, the cardiac efficiency was determined. In the animals receiving digitalis the heart functioned more efficiently than in the controls.

The heart muscle of aging people loses water.

This may be part of the general aging process which includes wrinkling of the skin and shrinking of subcutaneous tissues. Pharmacologists have shown that digitalis increases the water content in the heart muscle. This helps to explain its "tonic" action in old age. There is clinical evidence to show that aged people show energy on taking digitalis and lapse into progressing signs of circulatory failure when it is dropped.

Digitalis is fixed in the heart muscle and is somehow broken down there. The splitting of the molecules takes place slowly, and thus digitalis is an ideal drug to give in small doses over long periods of time.

Dr. Christian pointed out that there are certain laws governing the use of digitalis that tend to make the heart a somewhat automatic regulator of its own necessary dosage. The action of digitalis varies directly with the mass of the heart muscle. A large heart therefore fixes more digitalis than a small heart, and hence we get a greater effect in the case of hypertrophied hearts. The amount of digitalis fixed by the heart muscle varies with the speed or rate of the blood flowing through the heart muscle. As the coronary circulation slows in decompensation, more digitalis is taken up and hence the benefit to the heart is greater.

In using a drug over long periods of time, it is necessary to consider (1) whether the drug loses its effectiveness and the patient develops a tolerance for it, and (2) whether the drug causes any harm. Clinically there is no evidence to substantiate either of these points against digitalis.

Hypertension is the striking example of a condition in which cardiac enlargement can be anticipated and in it digitalis should be of value in inhibiting cardiac hypertrophy. Dr. Christian has stated that he is coming to use it more and more in such cases. As in myxedema we give thyroid for the remaining life span, as in pernicious anemia we give liver, so in cardiac hypertrophy we should give digitalis for the rest of the patient's life.

Dr. Reid Hunt opened the discussion of the papers. He stated that the heart has 14 times as great an avidity for digitalis as skeletal muscle. This is difficult to understand in view of the anatomical similarity of these tissues. This is, no doubt, due to the rapidity with which the heart utilizes dextrose, and since the active digitalis bodies are glucosides, they are readily fixed in the cardiac muscle.

Dr. Paul D. White stated that he is especially thankful to Dr. Christian for his contributions to digitalis therapy. The first advance came when he noted that digitalis was of value in congestive failure other than that coupled with auricular fibrillation. Those who were educated in the English school first doubted this, but are now gradually swinging to the other point of view.

In regard to the use of digitalis in cardiac conditions other than congestive failure, Dr. White stated that he had found it especially useful in pulmonary edema. Digitalis will delay these attacks and prolong the life of the patient. Patients with aortic regurgitation, who are prone to failure, are also benefited by digitalis.

Dr. Levine spoke of experiments that he carried out during the war. He desired to find some test for digitalis in the blood stream, and worked with embryo chick hearts. These hearts were in the tubular form, and heart block was evidenced very beautifully by the two to one or three to one rhythm which could be seen under the microscope.

In closing, Dr. Christian spoke of the death of Dr. W. S. Thayer. Dr. Thayer was the first Physician-in-Chief, pro tempore, at the Peter Bent Brigham Hospital. He was selected at the time, because he was considered the ideal man to represent such a physician. He was much beloved, a courtly gentleman, a scholar in medicine, and a man well equipped in the fine art of the care of the patient.

A FRACTURE MEETING

There will be a conference under the auspices of the Fracture Service of the Massachusetts General Hospital, Monday evening, January 16, at eight o'clock in the Lower Outpatient Amphitheatre.

Subjects:

Fractures of the Shaft of Humerus, Dr. H. Rogers.

Fractures of the Patella, Dr. A. W. Allen.

Injuries to the Tarsal Bones, Dr. P. D. Wilson.

Dislocation of the Clavicle, Dr. J. S. Barr.

House-officers, students and visitors welcome.

PHILIP D. WILSON, M.D., *Associate Chief.*

BOSTON MEDICAL HISTORY CLUB

BOSTON MEDICAL LIBRARY

Monday, January 16, at 8:15 P.M.

Egyptian Medicine

1. Introduction and Note on Medical Papyri. Henry R. Viets, M.D.
2. The Edwin Smith Papyrus. F. T. Hunter, M.D.
3. Egypt at the Time of the Smith Papyrus. Mr. Dows Dunham, Assistant Curator, Department of Egyptian Art, Boston Museum of Fine Arts.

Illustrated by stereopticon slides.

JAMES F. BALLARD, *Secretary.*

8 The Fenway.

BOSTON MEDICAL LIBRARY

ANNUAL MEETING

The Annual Meeting of the Boston Medical Library will be held on Tuesday evening, January 17, at the Library, 8 The Fenway, at 8:15 o'clock.

Following the business meeting, Dr. H. Ostrom will give a talk entitled "Seventeen Years in

Equatorial Africa." Illustrated by lantern slides. Light refreshments after the meeting.

HORACE BINNEY, *Secretary.*

NEW ENGLAND HOSPITAL FOR WOMEN AND CHILDREN

The regular clinico-pathological conference of the New England Hospital for Women and Children will be held at the hospital, Dimock Street, Roxbury, on Thursday, January 26, at 8 P.M., with the following program: (These cases will be presented in groups for comparison.) Five of Premature Detachment of Placenta, discussed by Drs. Atwood and Olga Leary; Two of Toxemia of Pregnancy, discussed by Dr. Woodman; Five of Hyperthyroidism, discussed by Drs. Kimpton and Olga Leary. Please note postponement from third to fourth Thursday.

ALICE H. BIGELOW, M.D., *Secretary.*

BOSTON MEDICAL LIBRARY IN CONJUNCTION WITH THE SUFFOLK DISTRICT MEDICAL SOCIETY*

The January meeting of the Boston Medical Library will be held in conjunction with the Suffolk District Medical Society on Wednesday, January 25 at 8:15 P.M., in John Ware Hall.

Psychiatry Today. Dr. Ralph A. Noble, Director, Division of Psychiatric Education, National Committee for Mental Hygiene.

Psychiatry in Relation to Hospital Practice. Dr. Donald J. MacPherson.

Psychiatry in Relation to Private Practice. Dr. Arlie V. Bock.

Discussers: Dr. C. Macfie Campbell, Dr. Charles W. Hutchinson, of Concord, Dr. Fresenius Van Nüys, Weston.

WILLIAM H. ROBEY, M.D., *President,*
HILBERT F. DAY, M.D., *Chairman.*

GREATER BOSTON MEDICAL SOCIETY

There will be a special meeting of the Greater Boston Medical Society on Wednesday, January 18, at 8:15 P.M., at the Boston Medical Library, 8 The Fenway, Boston.

PROGRAM

The Changing Relations of Ophthalmology to Internal Medicine. Dr. Jonas S. Friedenwald, Baltimore, Maryland.

Discussion: Dr. Herrman L. Blumgart.

Physicians and students are cordially invited.

BERNARD I. GOLDBERG, M.D., *Secretary.*

483 Beacon Street, Boston, Mass.

NEW ENGLAND PHYSICAL THERAPY SOCIETY

The regular meeting of the New England Physical Therapy Society will be held in the Music Room of the Boston Square and Compass Club, 448 Beacon Street, Boston, Massachusetts, at 8 P.M., on January 18.

Dr. William G. Curtis is the Program Chairman for this meeting.

PROGRAM

The Use of Physical Therapy in Dermatological Conditions. Francis P. McCarthy, M.D., Dermatologist at Boston City Hospital, Professor of Oral Diseases at Tufts Dental College.

Discussion to be opened by Dr. George E. Percy.

A Round Table Dinner at 6:30 will precede the meeting. Please notify the Secretary if you plan to attend the dinner.

The President urges the members to bring in clinical cases and reports.

All members of the medical profession are cordially invited to attend.

ARTHUR H. RING, *Secretary.*

*Attention is called to the editorial entitled "A New Era in Psychiatry" on Page 98.

SOCIETY MEETINGS
CONGRESSES AND CONFERENCES

January 15 - March 26—Harvard University, Free Public Lectures on Medical Subjects. See page 104.
January 16—Boston Medical History Club. See page 108.
January 16—A Fracture Meeting. (Massachusetts General Hospital.) See page 108.
January 17—Boston Medical Library. See page 108.
January 17—South End Medical Club. See page 55, issue of January 5.
January 18—Greater Boston Medical Society. See notice elsewhere on this page.
January 18—New England Physical Therapy Society. See notice elsewhere on this page.
January 19—Clinics in Medicine at Peter Bent Brigham Hospital. See page 104.
January 25—Boston Medical Library in conjunction with the Suffolk District Medical Society. See notice elsewhere on this page.
January 26—New England Hospital for Women and Children. See notice elsewhere on this page.
February 6-10—The American College of Physicians. See page 765, issue of October 27.
February 8 - April 5—The New England Heart Association. See page 1011, issue of December 1.
February 10 - May 12—William Harvey Society. See page 765, issue of October 27.
February 17 and 18—The New England Hospital Association. See notice on page 911, issue of November 17.

DISTRICT MEDICAL SOCIETIES

ESSEX NORTH DISTRICT MEDICAL SOCIETY

January 13—See notice on page 1235, issue of December 29.

May 3—Wednesday, Annual Meeting. Program to be announced.

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

Tentative Program

Wednesday, February 1, 1933—Council Meeting, Boston.

Wednesday, March 8, 1933—Lynn Hospital. Clinic 5 P. M. Dinner 7 P. M. Speaker: Dr. Soma Weiss, Boston City Hospital. Subject: Arterial Hypertension.

Wednesday, April 5, 1933—Essex Sanatorium, Middleton. Clinic 5 P. M. Dinner 7 P. M. Speaker: Dr. Wilson G. Smillie, Professor of Public Health Administration, School of Public Health, Harvard University. Subject: Common Colds.

Thursday, May 4, 1933—Censors' Meeting, Salem Hospital, 3:30 P. M.

Tuesday, May 9, 1933—Annual Meeting. Salem Country Club, Forest Street, Peabody. Golf in afternoon; greens fee $2.00. Dinner at 7 P. M. Speaker: Dr. George Burgess Magrath. Subject to be announced later. Ladies invited.

R. E. STONE, M.D., Secretary.

FRANKLIN DISTRICT MEDICAL SOCIETY

Meetings will be held at the Weldon in Greenfield on the second Tuesday of March and May.

CHARLES MOLINE, Secretary.

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

The program of the Middlesex East District Medical Society for the coming year is as follows:

March 15 at Melrose.

May, at the Meadowbrook Club, Reading.

ALLAN R. CUNNINGHAM, Secretary.

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY

January 13—See notice on page 1123, issue of December 15.

NORFOLK DISTRICT MEDICAL SOCIETY

January 31, 1933—Roxbury Masonic Temple, 8 P. M. Subject: "Stomach Surgery"—Motion pictures. Dr. William R. Morrison.

February 28, 1933—Time and place to be announced. "The Diagnosis and Treatment of Anemia," by Dr. William P. Murphy.

March 28, 1933—Time, place and subject to be announced. Speaker will be Dr. J. P. O'Hare.

May—Annual Meeting. Time, place and subject to be announced.

FRANK S. CRUICKSHANK, M.D., Secretary.
1695 Beacon Street, Brookline.

SUFFOLK DISTRICT MEDICAL SOCIETY

Wednesdays at 8:15 P. M.

January 25, 1933—General Meeting in association with the Boston Medical Library at the Boston Medical Library. See page 109. (Boston Medical Library.)

March 29, 1933—Clinical Program, Massachusetts General Hospital.

April 26, 1933—Annual Meeting. Election of Officers. Scientific Program—Titles and speakers to be announced later.

The Medical Profession is cordially invited to attend all of these meetings.

WILLIAM H. ROBEY, M.D., President,
LELAND S. McKITTRICK, M.D., Secretary,
HILBERT F. DAY, M.D., Boston Medical Library.

WORCESTER DISTRICT MEDICAL SOCIETY

Wednesday, February 8—Dinner and scientific meeting at the Worcester State Hospital. Program to be announced later.

Wednesday, March 8—Dinner and scientific program at the Memorial Hospital, Worcester. Program to be announced later.

Wednesday, April 12—Dinner and scientific meeting at the Rutland State Hospital. Scientific program to be announced later.

Wednesday, May 10—The Annual Meeting. Place and program to be announced later.

ERWIN C. MILLER, Secretary.

BOOK REVIEWS

Internal Medicine. Its Theory and Practice in Contributions by American Authors. Edited by John H. Musser, M.D. 8° pp. 1316. Lea and Febiger. Philadelphia, 1932. Price $10.00.

This large one-volume book on Internal Medicine has in it all the virtues and defects of a work written by numerous authors, however much they have been carefully selected. The preface stresses the fact that all of the authors hold "professional appointments in medical schools". The selection of authors — each of whom writes a separate chapter —is on the whole good. It includes such men as Brown of the Mayo Clinic on Diseases of the Blood-Vessels, Bloomfield of San Francisco on Diseases of the Gastro-Intestinal Tract, Pepper of Philadelphia on the Virus Diseases, Chesney of Baltimore on the Spirochetal Diseases, Means of Boston on Diseases of the Endocrine Glands, Krumbhaar on Diseases of the Spleen and Reticulo-Endothelial System, and Wilder of the Mayo Clinic on Diseases of Metabolism. The preface states that "the ever-increasing complexities of internal medicine and the steadily mounting mass of facts that pertain to disease make it an impossibility for any one man to write with authority on such a large subject". This is undoubtedly a cogent reason for the present tendency to shift from the classic volumes of Osler and Strümpell to these multi-author books of the type of Cecil and now of Musser. One misses, however, except in a few chapters, the smooth even style of Osler's writing and notes instead the unevenness of presentation, which to be sure is inevitable.

The book is unusually well systematized, well printed, and well edited. The description of each disease is preceded by a list of synonyms, a definition, and a short historical account and is completed by a list of references.

The first part of the volume deals with the infectious diseases and is admirably separated into chapters on bacillary, coccal, virus, rickettsial, spirochetal, protozoal and metazoal diseases, and on the contagious diseases of childhood, diseases of unknown etiology, and the fungus infections. Reimann of Minneapolis writes the section on Bacillary Diseases and begins, following classical tradition, with typhoid fever. There are excellent sections on undulant fever, tularemia, and influenza. The Coccal Diseases are routinely handled by Kinsella of St. Louis. His section on Lobar Pneumonia cannot be compared in treatment or in scope with that of Cecil in the latter's Textbook of Medicine; the statement (attributed to Cole) that whole horse serum is superior to antibody extracts is to be questioned. The chapter on Virus Diseases by Pepper of Philadelphia is a thirty-page gem of excellent writing and accurate information. Here are found accounts of psittacosis and of common cold. Van Valzah of Wisconsin writes the chapter on Diseases due to Rickettsiae. The glaring deficiency here is the lack of mention of the recent work of Dyer, Maxey, and Zinsser and co-workers on other vectors than lice of typhus fever and associated diseases. The chapter on Diseases due to Spirochaetes by Chesney presents excellent writing and discriminating judgment particularly in regard to the treatment of syphilis. A minor omission in the chapter on protozoal diseases by Craig of New Orleans is some description of the recently discovered pathogenicity of trichomonas vaginalis. A short, though important section is that of Lemann of New Orleans on the Fungus Diseases. The inclusion of sprue by Sydenstricker of Augusta among the (infectious) Diseases of Doubtful Etiology is to be questioned in view of Castle's recent work.

The chapter on Diseases of the Heart (102 pages) by Fred M. Smith of Iowa is systematic and adequate although not brilliant. That "hypertensive heart disease" is synonymous with "arteriosclerotic heart disease" will be questioned by many. The diagnosis of hyperthyroid heart disease in its

"masked" or "apathetic" form is mentioned although not sufficiently stressed.

The chapter on Diseases of the Blood-Vessels by George E. Brown of the Mayo Clinic is exceedingly well written. It contains a section on hypertension which is authoritative and sensible and one of the best in the book. The chapter by Miller of New York on Diseases of the Respiratory Tract, including pulmonary tuberculosis, is complete. The physiological explanation of symptoms given at the beginning of this chapter is admirable. Bloomfield's chapter on Diseases of the Digestive Tract may be ranked as one of the book's best. It is well planned and written in an easy style. The directions for treatment are free of that hocus-pocus which one has become accustomed to associate with certain gastro-enterological writings. One feels sorry that the same author could not have written the chapter which follows: "Diseases of the Liver, Gall-Bladder, Bile Duct, Pancreas, and Peritoneum" by M. A. Blakenhorn of Cleveland. This chapter, which appears to be routinely written, is guilty of several errors of omission (such as the failure to include some discussion of the van den Bergh test). It is distinctly not of 1932. Witness this definition for "catarrhal jaundice": "A condition in which jaundice results from catarrh of the bile duct." No mention is made of the recent use of high carbohydrate feeding in the disease.

In "Diseases of the Urinary Tract" written by McCann of Rochester, N.Y., we find a thorough, up-to-date chapter in which there are excellent discussions of the pathological physiology, symptomatology, and functional tests in nephritis. Means' chapter on Diseases of the Endocrines is of course excellent. It contains one of the first discussions in textbooks of "hypometabolism without myxedema", a condition which appears to be on the increase, and of "Cushing's syndrome" (pituitary basophilism).

Sturgis of Ann Arbor writes the chapter on Diseases of the Blood. It is on the whole an authoritative, very modern account of present-day hematology by one of the leaders in that field. However, the chapter is deficient in its lack of an introductory section on the pathology and physiology of the blood-forming organs as well as in some mention of recent methods for studying the blood (supra-vital staining, cell-volume studies, etc.). Castle's epoch-making contributions to the etiology of pernicious anemia are not sufficiently stressed. However, the discussion of "idiopathic microcytic anemia" (primary hypochromic anemia, simple achlorhydric anemia) is excellent, and sufficient stress is laid on its growing clinical importance. The section on leukemia appears poorly classified, although monocytic leukemia receives well-merited attention. Krumbhaar writes a short section on the Reticulo-Endothelial System in his chapter on the Diseases of the Spleen.

The chapter on Diseases of the Locomotor System by Torrey is adequate. Musser's chapter on Diseases of Nutrition is excellent. The reviewer cannot say the same for the chapter on Diseases of Allergy by Cooke, which appears to be rather dogmatically written. Such statements appear: "Belladonna, atropine, benzyl benzoate and nitroglycerin are useless" (in the treatment of asthma). "Better results occur (in asthma) with the more radical types of operative procedure" (on the nose and throat). Wilder's chapter on Diseases of Metabolism—which includes gout, diabetes and obesity—is a model of excellent medical writing. The chapter on the Psychoses and Neuroses by Strecker of Philadelphia is well written and modern in its treatment. A more detailed account of neurasthenia and of its immense importance in clinical medicine might have been given. There is a long and complete treatise on the Organic Diseases of the Nervous System by Wilson of Philadelphia.

As stated above, and as may be inferred from the reviews of the various chapters, the book has the fault of unevenness together with the virtue of presenting in one volume the specialized knowledge of recognized leaders in the various fields of internal medicine. It will inevitably be compared with its predecessor, Cecil's Text Book of Medicine. The reviewer confesses a preference for Cecil's book. However, it must certainly be admitted that in Musser's Internal Medicine we have an exceedingly well-written and well-systematized volume which will undoubtedly take its place among the most used books on this subject. The tide seems to be turning against the single-volume work written by one man. It is well to remember, however, that Osler's Text Book of Medicine is still a classic, and in many respects the superior of either Cecil's or Musser's book.

The Curative Value of Light. By EDGAR MAYER, M.D. Appleton Popular Health Series. D. Appleton & Company, New York. 175 pp. Price $1.50.

This volume is intended for the layman who desires to known something about the whys and wherefores of Light Therapy. It is of timely interest because of the increasing popularity of the "sun bath" and the increasing use of ultra-violet lamps in the home, often entirely without any medical supervision. Dr. Mayer, because of his special training and experience in this field, is able to speak with authority. After a brief history of light therapy, he discusses the sun bath, the value of light in deficiency diseases, tuberculosis, certain other diseases, vitamines, and the therapeutic value of certain irradiated foods. Chapter VII discusses some of the disputed claims as to the value of light therapy in common colds, the anemias, and as a general tonic.

Dr. Mayer is careful to give the exact technique to be followed in taking a "sun bath", and in the use of the ultra-violet lamp in the home. The dangers from improper or overuse are emphasized. He also stresses the necessity for medical supervision. The

latter is extremely important since lamps emitting wave lengths shorter than those found in normal sunlight are potentially dangerous and should never be used in the home except on the advice of a physician and under his immediate supervision. We all know the troubles of the early x-ray operators due to their ignorance of the cumulative effect of repeated exposures. We cannot yet say with certainty that similar repeated exposures to ultra-violet wave lengths shorter than we are accustomed to in the solar spectrum may not in time produce unexpected injurious results. Likewise we know what happens to the individual who, in his enthusiasm to acquire a coat of tan, spends at the start too long a time in the sun. A heat stroke or an acute sunburn alone is bad enough, but the systemic effects in some cases may be even more serious.

Sun baths and ultra-violet lamps have a definite therapeutic value when properly used. This book will enable the physician to advise his patients intelligently.

Hydrotherapy in Hospitals for Mental Diseases. By REBEKAH WRIGHT, M.D. Boston, Mass. The Tudor Press, Inc., 1932. 396 pages.

This is an excellent book, in many ways, on the subject of hydrotherapy, particularly valuable in giving the technique of various kinds of application of hot and cold water, accompanied by excellent illustrations showing every step in the various procedures. These illustrations are greatly to be commended. As a manual for nurses and instructors in hospitals the book could hardly be improved upon. This is also true of the parts devoted to technical methods of keeping records and of equipping a hydriatric suite in a hospital. In the latter chapters architectural plans are given in some detail.

The weakest parts of the book are the chapters devoted to hydrotherapy and its application to medicine from the physician's point of view. Here the author treads on very uncertain ground and, in her enthusiasm for the subject, oversteps the path usually followed by conservative physicians. Many illustrations of this kind need not be quoted; two will suffice to point out the bad features of the book. Under the heading of "Meningitis" for instance, the author says: "In the early stage of meningitis the fomentation to the spine acts as a derivative and relieves pain" (p. 311). This may be so, but what physician would ever think of giving such unimportant treatment in such a severe disease? Her physiology might be open to question also in the statement: "Continued cold to the head lowers the temperature of the brain. The cerebral thermic centers are depressed" (p. 58). Is there any real scientific basis for such statement? Hydrotherapy is, however, very useful in the treatment of many cases of mental disease and it is to this group of patients that the book pays special attention.

The format of the book leaves a good deal to be desired; the paper is unnecessarily heavy and the type too large. A smaller and lighter book of equal value might easily have been published.

BOOKS RECEIVED FOR REVIEW

Skin Diseases and Nutrition including the Dermatoses of Children by Erich Urbach. Authorized English Translation by Frederick Rehm Schmidt. Published by Wilhelm Maudrich. 242 Pages. Price $7.00.

Hydrotherapy in Hospitals for Mental Diseases by Rebekah Wright. Published by The Tudor Press, Inc. 396 Pages.

The Colon, Rectum and Anus by Fred W. Rankin, J. Arnold Bargen and Louis A. Buie. Published by W. B. Saunders Company. 846 Pages. Price $9.50.

The Surgical Clinics of North America. October, 1932. Volume 12, Number 5. Chicago Number. Published by W. B. Saunders Company. 268 Pages.

Erdmann's Clinics. Excerpts selected from the clinics of John F. Erdmann. Edited by J. William Hinton. Published by W. B. Saunders Company. 315 Pages. Price $4.50.

The Differential Diagnosis of Endocrine Disorders by Allan Winter Rowe. Published by The Williams & Wilkins Company. 220 Pages. Price $4.00.

The Medical Art Calendar 1933. Published by J. Philip Kruseman. Price $1.50.

A Handbook of Experimental Pathology by George Wagoner and R. Philip Custer. Published by Charles C. Thomas. 160 Pages. Price $4.00.

Children's Tonsils In or Out by Albert D. Kaiser. Published by J. B. Lippincott Company. 307 Pages. Price $5.00.

Synopsis of Gynecology. Based on the Textbook *Diseases of Women* by Harry Sturgeon Crossen and Robert James Crossen. Published by The C. V. Mosby Company. 227 Pages. Price $2.75.

Clinical Gynecology by C. Jeff Miller. Published by The C. V. Mosby Company. 560 Pages. Price $10.00.

Injuries of the Eye. Diagnosis and Treatment, Forensic Procedures and Visual Economics by Harry Vanderbilt Würdemann. Second Edition. Published by The C. V. Mosby Company. 900 Pages. Price $13.50.

Poliomyelitis. A survey made possible by a grant from the International Committee for the Study of Infantile Paralysis. Organized by Jeremiah Milbank. Published by The Williams & Wilkins Company. 562 Pages. Price $6.00.

Clinique et Thérapeutique Hydro-Climatiques by Maurice Villaret and L. Justin-Besançon. Published by Masson et Cie. 254 Pages. Price 30 fr.

Your Hearing — How to Preserve and Aid It by Wendell Christopher Phillips and Hugh Grant Rowell. Published by D. Appleton and Company. 232 Pages. Price $2.00.